No-Cost Extension Year Evaluation Report

Automotive Manufacturing
Technical Education Collaborative
(AMTEC II)

NSF Award 1304600

May 2017
SCATE Inc. is a 501(c)(3) not-for-profit corporation organized for educational purposes to improve the nation’s technological workforce. SCATE, Inc. provides educational and professional services, promotes best practices, consults with educators, collaborates with private and public entities, and conducts research to affect Systemic Change in Advanced Technological Education (SCATE).

SCATE Inc. promotes and disseminates successful models and products developed through the work of the South Carolina Advanced Technological Education (SC ATE) Center of Excellence, an initiative partially funded by the National Science Foundation and dedicated to increasing the quantity, quality, and diversity of highly skilled technicians to support economic development.

SCATE Inc.
2715 W. Lucas Street, Room 5214
Florence, SC 29501-0548
(803) 447-7718
# TABLE OF CONTENTS

## EXECUTIVE SUMMARY

-  EXECUTIVE SUMMARY .................................................................................................................. 1

## PROJECT OVERVIEW

-  PROJECT OVERVIEW .................................................................................................................... 3
-  The AMTEC II Project and Goal Team Leadership ...................................................................... 5
-  AMTEC Partners ............................................................................................................................ 6
-  Evaluation Strategies ....................................................................................................................... 6

## SUMMARY OF GOAL PROGRESS AND RELATED DELIVERABLES

-  SUMMARY OF GOAL PROGRESS AND RELATED DELIVERABLES ............................................. 8
-  AMTEC Goal 1 ............................................................................................................................... 10
-  AMTEC Goal 2 ............................................................................................................................... 12
-  AMTEC Goal 3 ............................................................................................................................... 15
-  AMTEC Goal 4 ............................................................................................................................... 19

## EVALUATION

-  EVALUATION .................................................................................................................................. 21

## CONCLUSIONS AND UNANTICIPATED OUTCOMES

-  CONCLUSIONS AND UNANTICIPATED OUTCOMES .................................................................... 22
-  Conclusions ....................................................................................................................................... 22
-  Unanticipated Outcomes .................................................................................................................. 23

## FIGURES AND TABLES

-  FIGURES AND TABLES .................................................................................................................... 24
-  Figure 1. AMTEC Partnerships by State ......................................................................................... 3
-  Figure 2. AMTEC II Organizational Chart ..................................................................................... 6
-  Figure 3. Media Kit Contents .......................................................................................................... 16
-  Table 1. AMTEC to AMTEC II Work Focus Change .................................................................... 4
-  Table 2. AMTEC Goals, Objectives, and Deliverables with Evaluation Comments ....................... 10

## APPENDICES

-  APPENDICES ................................................................................................................................. 24
-  Appendix A. Evaluation Plan and Logic Model ................................................................................ 24
-  Appendix B. AMTEC II Personnel and Key Stakeholders ................................................................. 36
-  Appendix C. AMTEC Academic and Industry Partners ................................................................. 38
-  Appendix D. Supporting Evaluation Documents ........................................................................... 43
-  Appendix E. Site Visit, Partner and Focus Group Interview Protocols ............................................ 46
-  Appendix F. Curriculum Delphi ...................................................................................................... 52
-  Appendix G. SCATE Inc. NVC Presentations: 2017, 2016, 2015 .................................................... 55
-  Appendix H. Simulation Development .............................................................................................. 66
EXECUTIVE SUMMARY

This report presents the no-cost extension year results of the Automotive Manufacturing Technical Education Collaborative (AMTEC) National Center of Excellence, funded as AMTEC II by the National Science Foundation in 2013. Through prior National Science Foundation Center funding, AMTEC first became a National Center of Excellence in August 2009. This designation occurred after AMTEC successfully executed a planning grant and then a project grant, also supported by NSF funding.

In July 2014, SCATE Inc. became the external evaluator for AMTEC II, superseding the Community College Research Center (CCRC) Columbia University, New York. SCATE Inc. is a 501 (c)(3), not-for-profit corporation affiliated with the South Carolina ATE (SC ATE) Center of Excellence, Florence-Darlington Technical College, Florence, South Carolina.

Project evaluation was guided by the following overarching evaluation question:

To what extent has AMTEC facilitated the pathway for target groups to enter the automotive industry, provided industry with a well-trained sustainable pool of employees capable of advancing automotive manufacturing in the United States, and expanded the AMTEC collaborative model for replication within other industry sectors?

Specifically, to what degree has AMTEC attained the following four project goals?

**Goal 1:** Implement industry-endorsed, advanced curriculum AMTEC AAS degree program to increase student exposure to critical thinking and problem-solving skills.

**Goal 2:** Institutionalize the AMTEC Career Pathway Model with current AMTEC colleges and their secondary school and industry partners.

**Goal 3:** Expand the AMTEC Career Pathway Model with current AMTEC colleges and their secondary school and industry partners.

**Goal 4:** Drive performance improvement through the use of performance measures that systematically align AMTEC organizational direction and resources.

One of AMTEC’s hallmarks is its academic and industry partnerships, which are integral to the success of AMTEC II. Through the life of AMTEC II, the number of active academic and industry partners fluctuated. AMTEC and/or AMTEC II indicate that, over time, there have been partners located in 18 states. When considering AMTEC’s success in attaining project goals and deliverables, SCATE Inc. has documented evidence to support the attainment of all deliverables associated with the project Goals 1, 2 and 4. A minimal amount of work remains to be completed and/or documented for Goal 3 deliverables.

Tangential to the project’s stipulated roster of deliverables, SCATE Inc. captured evidence of AMTEC’s broader impact. Evidence of impact ranges from (1) a rural community college’s adoption of AMTEC as its “industry” partner—helping to align the college curriculum to industry needs and supporting program success to (2) partnership expansion beyond the automotive manufacturing and automotive services areas to include aerospace, agricultural, chemical, food and tool industries.
The ultimate impact and success of AMTEC II is measured by the availability of a sufficient number of multi-skilled, AMTEC-prepared technicians available for industry jobs. Initially, data capture was challenging, but there is quantitative and qualitative evidence that AMTEC has made a notable contribution to the preparation of technicians with industry-validated skills that would not otherwise have been available for the U.S. workforce.
PROJECT OVERVIEW

Through prior National Science Foundation Center funding, the Automotive Manufacturing Technical Education Collaborative (AMTEC) first became a National Center of Excellence in August 2009. This designation occurred after AMTEC successfully implemented a planning grant followed by a project grant, also supported by National Science Foundation Advanced Technological Education (NSF ATE) funding. AMTEC II, similar to the original AMTEC, is funded by a grant awarded to the Kentucky Community and Technical College System. AMTEC and AMTEC II have built on the synergies of established, industry-wide partnerships with community colleges and industry in 18 states (see Figure 1). Whereas additional college and academic partners were identified and existed earlier in the project, however, some are now considered inactive (http://autoworkforce.org). Over time, there have been AMTEC and/or AMTEC II partners located in Alabama, California, Illinois, Indiana, Kentucky, Michigan, Mississippi, Missouri, New York, Ohio, Oregon, South Carolina, Tennessee, Texas, Virginia, Washington, West Virginia, and Wisconsin.

Figure 1. AMTEC Partnerships by State as Indicated by AMTEC as of May 2017

The original goals of the AMTEC National Center of Excellence were to foster cooperation between academia and industry, create partnerships in delivering technical education, increase secondary and postsecondary transitions, and create a transportable mode for technician education. In its original motivating rationale, AMTEC presented four major reasons for the necessity of an automotive national center of excellence: an obsolete educational system, the changing nature of advanced manufacturing to include ever-increasing technology, the high cost of workforce education, and the importance of the industry as a whole to the national economy.

The next generation National Center of Excellence, AMTEC II, proposed to move to a second phase in addressing these concerns. The intention of this phase was to address new areas of expertise, deeper implementation, expanded coverage and partnerships as well as the development and institutionalization of learning analytics to enable AMTEC II data to drive performance improvement in technician education.

The transition of work focus from the first phase, AMTEC, to the second phase, AMTEC II, is outlined in Table 1 on Page 4 and guided the development of AMTEC II goals and objectives, which follow Table 1.
<table>
<thead>
<tr>
<th>AMTEC</th>
<th>AMTEC II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developed and implemented national, industry-driven, modularized AAS mechatronics (integrated systems) maintenance technical education curriculum that meets high priority needs of automotive manufacturers and suppliers.</td>
<td>Expand on modularized content to incorporate industry-driven, fault-based scenarios as well as develop and implement new, advanced certificates.</td>
</tr>
<tr>
<td>Developed a literature-based, exemplary AMTEC Career Pathway framework model with AMTEC-partner case studies used to validate accuracy of model.</td>
<td>Systemically institutionalize best practices of AMTEC’s explicit, integrated, high-quality career pathway and begin validating its success with various cohorts of stakeholders entering, and progressing through, the pathway.</td>
</tr>
<tr>
<td>Implemented a collaborative support system to sustain the AMTEC model with core partners, experienced substantial growth in membership.</td>
<td>Expand the collaborative support process for AMTEC partners to grow, sustain and replicate the AMTEC model to improve student transitions and increase student success. Provide pedagogical resources to more deeply engage AMTEC faculty who are subject matter experts, but perhaps not pedagogy experts in issues of student success through targeted high-caliber professional development opportunities in the culture of evidence and data analysis as well as expanding AMTEC’s clearinghouse of technical resources.</td>
</tr>
<tr>
<td>Developed and implemented one of a planned series of assessment instruments aligned to the industry-developed technical standards.</td>
<td>Use evidence-based strategies, such as hosting data summits and longitudinal cohort analysis, focused on student achievement data, to systematically foster a culture of evidence in the colleges and industries to sustain and improve success rates of students and stakeholders as well as document and improve AMTEC’s effectiveness, efficiency and partner engagement.</td>
</tr>
</tbody>
</table>

*NSF Proposal 1304600

Project goals were supported by objectives designed to attain curriculum and assessment and learning analytics deliverables. A complete listing of AMTEC II goals and corresponding objectives and deliverables appears in Table 2 on Page 10 and are discussed from an evaluation perspective.
The following excerpt from AMTEC’s last funding proposal to the National Science Foundation summarizes the work of its previously funded projects, which served as the foundation on which the AMTEC II project was built:

The Center has developed, tested and disseminated an industry-driven, standards-based, modularized automotive technology curriculum that addresses most of the competencies industry requires of technicians. Professional development is provided for community college faculty and high school teachers. The work is expanded by institutionalizing the AMTEC Career Pathway, the instructional and industry-endorsed collaboration models and by fostering an environment of evidence-based decision-making using analytics to sustain and improve performance. New strategies such as fault-based scenarios, accelerated learning, use of simulators, and competency-based instruction are implemented.

AMTEC has developed and implemented an effective, efficient three-tiered process to assess student achievement. Pre and post module assessments measure student progress. End of course assessments are developed by industry as are certification examinations. The assessments provide information about how well students or industry candidates progress through the industry-defined occupational standards. The data provide the evidence to be used by partner colleges to improve their programming and curricula as AMTEC and they make decisions about what works with students.

SCATE Inc. evaluators note that activities in two primary areas have seemed to drive the AMTEC II agenda. This was determined through observation, discussion with AMTEC II leadership, and participation in weekly AMTEC II phone conferences. The Project Director and leadership team are to be commended for aggressive outreach through project-related presentations at numerous conferences and meetings, working to increase partnerships and the use of AMTEC curriculum, assessments, and the AMTEC integrated manufacturing system simulator. Also, throughout AMTEC II the leadership team diligently continued to refine the curriculum and assessments, based on industry input. As part of the evaluation process, SCATE Inc. conducted interviews with partners which confirmed their appreciation of engagement and feedback solicited by AMTEC II.

The AMTEC II Project and Goal Team Leadership

Similar to AMTEC, AMTEC II “is a collaboration made up of community colleges and industry partners and reports its progress on grant goals to its grant funder, the National Science Foundation (NSF).” AMTEC II leadership also reports its progress at its annual meeting of the National Visiting Committee (NVC). The Kentucky Community and Technical College System (KCTCS) serves as AMTEC II’s lead organization and fiscal agent for the [AMTEC] Center.

Under AMTEC II, Co-Principal Investigators (Co-PIs) are responsible for project deliverables associated with three of the four project goals. According to the funded scope of work, the Co-PIs are to collaborate with the AMTEC Center staff to provide leadership, specifically to lead “Goal Teams” to accomplish project goals. Goal Teams conduct activities in consultation with the PI and report progress to the PI. The Co-PIs serve as members of the AMTEC Leadership Team.
The AMTEC II Organizational Chart as presented on the AMTEC website is included as Figure 2. It should be noted that there are two occurrences of “AMTEC Associate College Partners,” although it is likely that one of these should be labeled as “AMTEC Industry Partners.” The chart identifies AMTEC II personnel and key stakeholders and summarizes their project responsibilities.

Figure 2. AMTEC II Organizational Chart

AMTEC Partners

AMTEC partners are defined as “any colleges, advanced manufacturers, auto manufacturers, auto technicians, and auto suppliers. Prospective partners enter at the Associate Partner level by signing an Associate Partner Memorandum of Understanding (MOU) of commitment. Associate partners are organizations of the automotive community and community colleges who have made a commitment and identify a primary representative to participate in activities of the Center.” Overall, the collaborative partnership seeks to elevate the preparedness of “highly skilled technicians and manufacturing engineers to work in the automotive industry.”

Opportunities for academic and industry partners to work with and learn from each other are embedded within the AMTEC structure. These opportunities include AMTEC Academies, workshops, meetings and professional development sessions.

The complete roster of academic and industry entities that have served as AMTEC partners throughout the life of the project is included in Appendix C.

Evaluation Strategies

SCATE Inc., a 501 (c)(3), not-for-profit corporation affiliated with the South Carolina ATE (SC ATE) Center of Excellence, Florence-Darlington Technical College, Florence, South Carolina, serves as external evaluator for AMTEC II. SCATE Inc. has evaluated projects funded by the National Science Foundation, the U.S. Department of Labor, the U.S. Department of Education, and state agencies for two- and four-year colleges, universities, and not-for-profit corporations in 27 states and internationally.
The Community College Research Center (CCRC) based at Columbia University served as evaluator for AMTEC during the 2009-2014 project period. This timeframe spanned the duration of AMTEC (2010-2013) and the first year of AMTEC II (2013-2014). The project engaged the evaluation services of SCATE Inc. beginning the second year of AMTEC II (2014-2015).

As the project’s external evaluator, SCATE Inc. became familiar with AMTEC by reviewing project documents that included the grant proposal; CCRC Final Evaluation Reports for Project Years 3, 4, and 5; the AMTEC website; the 2014 AMTEC presentation to the National Visiting Committee (NVC); and the *AMTEC by the Numbers* document. Subsequent to the review of these materials, SCATE Inc. developed documents and processes (including the evaluation plan and logic model included in Appendix A) to guide its evaluation work and to prepare for the evaluation launch meeting with the AMTEC II leadership team. As evaluation was underway, additional tools and resources were deemed necessary and were developed to assist with the evaluation process.

SCATE Inc. evaluated AMTEC II activities utilizing a mixed method design including both qualitative and quantitative methods and formative and summative feedback. These methods were employed to define and describe project outcomes and were discussed in interim and annual project reports.

The evaluation process was driven by the following evaluation question:

*To what extent has AMTEC facilitated the pathway for target groups to enter the automotive industry, provided industry with a well-trained sustainable pool of employees capable of advancing automotive manufacturing in the United States, and expanded the AMTEC collaborative model for replication within other industry sectors?*

To aid in formulating a response to the evaluation question, SCATE Inc. initiated multiple data collection methods and engaged with AMTEC II, its partners, and student users of the AMTEC curriculum in a variety of ways. In addition to engaging in routine meetings with the AMTEC II leadership team either in person or via weekly conference calls, SCATE Inc. conducted site visits and interviews with college and industry partners, observed AMTEC-sponsored events, and engaged AMTEC curriculum student-users in a focused session. Specific evaluation activities are identified in Appendix D.
SUMMARY OF GOAL PROGRESS AND RELATED DELIVERABLES

Overall, since the inception of AMTEC II, significant progress has been made toward attaining objectives and deliverables. The examples which follow illustrate some of the AMTEC II successes:

- AMTEC developed and utilizes a reiterative, “real-time” course review/curriculum updating process, informed by industry input.
- AMTEC reports having a roster of partners in 18 states.
- Partner interviews suggested appreciation for the AMTEC II team’s engagement of partners and consideration of their feedback.
- AMTEC II’s extensive roster of outreach efforts includes presentations made and/or meetings with national and international audiences for the purpose of promoting the AMTEC curriculum. AMTEC presented and/or exhibited at the Challenger Center (Louisville, KY – August 2014), NCPN (Lake Buena Vista, FL – October 2014), NSF ATE-PI Conference (Washington, DC – October 2014, 2015, and 2016), AACC WDI (Newport Beach, CA – January 2015), HI-TEC (Portland, OR – July 2015), NCPN (Indianapolis, IN – October 2016), ATEA (Orange Beach, AL – March 2016 and Nashville, TN – March 2017).
- Evaluation summaries from presentations and workshops indicated favorable consideration for AMTEC products and the intent to begin or continue use of the modules.
- AMTEC engaged the services of Purdue University professionals to develop virtual simulations to enhance module lessons. Purdue completed all of its AMTEC-contracted work during the no-cost extension period.
- AMTEC developed a tracking matrix, the “AMTEC Moodle 3.1 LMS and AMTEC Decision Support System.”

A distinctive highlight of Project Year 2 was the first-ever Nissan Maintenance Apprenticeship Academic Graduation of 22 individuals, accomplished collaboratively by TCAT-Murfreesboro (Tennessee College of Applied Technology) and AMTEC II. This class was the first group to utilize a new format for a maintenance apprenticeship, which was created to provide a new and accelerated educational opportunity focusing on maintenance-related core skill development. This included a five-week rotation between classroom education and hands-on, in-plant reinforcement. The two-year program included 4,160 hours of work, with 2,000 of those hours in the classroom.

At the end of Year 2, AMTEC informed SCATE Inc. that the project’s focus during Year 3 would be on curriculum enhancement, marketing and project sustainability. AMTEC devoted unending hours toward improving and updating modules based on industry feedback. AMTEC leadership continued to engage in outreach activities, disseminating information about the AMTEC curriculum. As AMTEC reported to the National Visiting Committee, there was noticeable movement toward implementing and attaining marketing deliverables. However, if more formal marketing strategies (i.e., the AMTEC Toolkit) had been launched earlier during AMTEC II, impact could have been determined over a longer time period.

During the no-cost extension period, AMTEC continued to disseminate information about AMTEC at conferences and increased the number of active AMTEC partners. AMTEC also devoted significant
energy toward developing a tracking matrix, the “AMTEC Moodle 3.1 LMS and AMTEC Decision Support System.”

AMTEC has earned the right to boast about its accomplishments throughout the funding and no-cost extension periods. Yet, progress toward attaining some objectives and deliverables remains incomplete. For example, as of this report, work remains to be done to complete the View Book (3.6).

AMTEC II goals, objectives, and deliverables correspond to the stated intent and impact of ATE Centers.

The innovations that ATE Centers and projects devise and test are model programs that reach students from secondary schools to community colleges and universities. They also generate career pathways for students to follow from certificate and degree programs to employment in established and emerging industries. [Source: ATE Centers, IMPACT: Partners with industry for a New American Workforce, 2016-2017, page 2.]

Beginning on Page 10, Table 2 identifies AMTEC II goals, objectives, and deliverables. From an evaluation perspective, AMTEC II progress toward attaining project deliverables is presented in the same table under the heading, “Evaluation Comments.”
Table 2
AMTEC GOALS, OBJECTIVES, AND DELIVERABLES

**Goal 1: Implement industry-endorsed, advanced curriculum AMTEC AAS degree program to increase student exposure to critical thinking and problem-solving skills**

1.1 Develop and implement additional, advanced courses and modules that result in advanced certificates in manufacturing maintenance and automotive service technology.*

Deliverable(s):
- Advanced modules that address 70 “advanced” skill standards identified in original DACUM/Delphi study (Goal 4, Objective 4.1)

*AMTEC indicates that NSF approved the elimination of the objective and deliverable.

1.2 Analyze data from AMTEC Delphi to identify advanced topics related to automotive manufacturing and service not already included in the current AMTEC Curriculum.

Deliverable(s):
- Delphi Study (Goal 4, Objective 4.1)
- Gap analysis of existing curriculum
- Identify advanced topics for potential future development

**Evaluation Comments:** An initial Delphi Study was completed during the previous AMTEC grant and continued to inform AMTEC II work. The results of the first Delphi study were provided to SCATE Inc. evaluators. The second Delphi study occurred during Year 3 of AMTEC II in February 2016. A detailed analysis of results was presented during the National Visiting Committee meeting April 12-13, 2016. There were 76 respondents in the first round and 50 respondents in the second round. SCATE Inc. is not surprised by the latter number of participants and believes that the lower number may be attributed to the number of active partnerships when the Delphi was administered.

Although there is nothing in the AMTEC-provided materials that is specifically labeled “gap analysis,” a gap analysis is inherently included in curriculum review processes. AMTEC II has provided evidence of ongoing curriculum review and modification, which has also been verified during evaluation interviews with AMTEC II industry partners (Nissan North America, Inc. and Toyota Motor Manufacturing Texas, Inc.).

During AMTEC’s no-cost extension period, the AMTEC leadership team engaged Delphi participants to evaluate Delphi results and to determine curriculum needs. Representatives from Nissan and Pellissippi Community College participated in the latter process, describing the curriculum as being 97% in alignment. They did request the following changes: “beefing up current content,” eliminating laser etching, and including welding content.

SCATE Inc. regards this deliverable as having been attained.
1.3 Develop scenarios for each module that challenge students to accomplish the most common and important maintenance and troubleshooting procedures and program these scenarios in the virtual integrated manufacturing simulator so that students have unlimited opportunities for practice.

**Deliverable(s):**
- Contract and implementation timeline with Purdue University to program scenarios for simulator
- Approximately 60 fault-based scenarios related to most common faults in advanced manufacturing equipment/process

**Evaluation Comments:** AMTEC is responsible for identifying faults and has provided documentation that this occurred. Purdue University was contracted to develop the fault-based scenarios. During AMTEC Weekly Team Conference Calls, Purdue University provided visual updates on its simulation development progress. It was anticipated that simulations would be completed in time to be tested with students at Somerset Community College prior to SCATE Inc. conducting a focus group session with them on March 30, 2016. Unfortunately, very limited student testing occurred prior to the scheduled session. Nonetheless, Purdue continued its development of fault-based scenarios for each module into the virtual simulator, having completed its work during the third quarter of the no-cost extension year.

SCATE Inc. regards this deliverable as having been attained.

1.4 Develop and implement a Virtual Manufacturing Simulator delivered online to allow students to use an online environment to learn and practice maintenance and troubleshooting of integrated manufacturing systems.

**Deliverable(s):**
- Contract and implementation timeline with Purdue University to develop simulator
- Virtual Integrated Manufacturing Simulator

**Evaluation Comments:** This activity was reinstituted during the 2014-15 program year. As indicated under Objective 1.3, Purdue University was contracted to develop the fault-based scenarios for integration into a Virtual Manufacturing Simulator. During AMTEC Weekly Team Conference Calls, Purdue University provided visual updates on its simulation development progress. It was anticipated that simulations would be completed in time to be tested by students at Somerset Community College prior to SCATE Inc. conducting a focus group session with them on March 30, 2016. However, very limited student testing occurred prior to the scheduled session. Purdue University completed its development of fault-based scenarios for each module into the virtual simulator during the third quarter of the no-cost extension year. AMTEC apprised the evaluator of the positive reactions that students at Somerset Community College had with testing the simulator during the no-cost extension year.

SCATE Inc. regards this deliverable as having been attained.
1.5 Implement a data-driven change control process for updating the digital lessons to improve their effectiveness.

Deliverable(s):
• Change control plan
• Evaluative feedback
• Formal analysis of feedback to determine high priority revisions

Evaluation Comments: The AMTEC Change Control Plan (process) includes pre-review steps, industry review process, and curriculum review. Evaluative feedback is incorporated under the “curriculum review” segment of the Change Control Process. High-priority revisions were slated by way of a review order for 2015, 2016, and 2017, which have been documented by the evaluator.

SCATE Inc. regards this AMTEC deliverable as having been attained.

1.6 Enhance curriculum and develop assessments for implementing a systems approach in automotive service technology.*

Deliverable(s):
• Gap analysis of current AMTEC curriculum to Auto Service skill standards
• Digital lessons that fill identified gaps
• Fault-based scenarios related to auto service
• Auto service technology assessments

*AMTEC indicates that NSF approved elimination of the objective and deliverables.

Goal 2: Institutionalize the AMTEC Career Pathway Model with current AMTEC colleges and their secondary school and industry partners

2.1 Expand the AMTEC “Career Pathway Case Study” by identifying and including at least five additional successful automotive/manufacturing career pathway models with corresponding educational requirements.

Deliverable(s):
• Three (3) model career pathway case studies

Evaluation Comments: In early 2012, case studies were completed for Alamo Colleges, Lansing Community College, the FLATE Program (Florida), Kentucky/Toyota, and Ivy Tech (Indiana). Five additional sites (Patrick Henry College; Shelton State Community College; Skyline College; Spartanburg Community College/BMW Manufacturing Company, LLC; and Worcester Technical High School) were identified for manufacturing career pathways case studies during the 2014-15 Project Year. In May 2017, AMTEC shared a draft of the complete case studies report with the NVC and the evaluators. While final editing remains to be done and a few gaps to be filled, AMTEC has exceeded expectations by providing more than the 3 case studies stated in the deliverable. The thorough exploration at each case study site that follows a consistent, research-based format of career pathway components will provide a valuable resource to educators once published.
The Executive Summary identifies the following case study sites: Patrick Henry Community College, Shelton State Community College, Macomb Community College, Sinclair Community College, St. Phillips Community College, Rio Hondo Community College, and Worcester High School. AMTEC research identified six characteristics for career pathway models: employer engagement, institutional and instructional transformation, wrap around services, partnerships, continuous improvement, and sustainability.

SCATE Inc. regards this deliverable as having been attained, but the benefit has not been maximized by publication and dissemination.

2.2 Develop a tracking matrix to identify student pathway selection to determine the success rate of the selected pathway model and certificates acquired from secondary to post-secondary; from post-secondary to four-year college/university; and/or employment.

Deliverable(s):
- AMTEC database for students and stakeholder persistence and completion at AMTEC partner colleges related to automotive and advanced manufacturing

Evaluation Comments: While AMTEC II is tracking students/participants by modules and assessments purchased and assessment results, AMTEC II was to develop a tracking matrix to depict participant pathways. Feedback generated from partner interviews in Project Year 3 verified the absence of tracking matrices at the AMTEC level and differing modes of tracking at the Academic Partner level. Evaluation interviews with AMTEC leadership team members partially attributed the absence of tracking matrices to AMTEC dependency on the colleges to provide the data, which had not been forthcoming. As a result, AMTEC II was faced with data-gap challenges resulting from lack of access to participant data at implementation sites. At the end of Year 3, this deliverable had not been met.

In November 2016, the AMTEC team began working on upgrades to the Moodle system for use as its LMS. By the end of January 2017, AMTEC reported that work with the LMS had generated “an array of responses” and that the learning curve had prompted the AMTEC team to “host 2-3 training webinars/week.” At that time, the AMTEC team also reported that they had “worked with 20 people and 13 colleges with active students enrolled in the system.” While still focused on module completion and associated assessments vs. overall enrollment or technician education program completers and employment, the new system provides real-time data to users to improve instruction. In addition, the new data dashboards provide indicators of instructor strengths and weaknesses across AMTEC content, point out potential weaknesses in instructional modules and/or assessment, and hold potential as an effective tool for assessment of prior learning.

During the no-cost extension period, AMTEC made significant progress in developing a tracking matrix by creating the AMTEC Moodle 3.1 LMS and AMTEC Decision Support System.

SCATE Inc. regards this deliverable as having been attained.
2.3 Disseminate best practices to implement site by site as well as Program Excellence Plans based on the review of the literature, best practices, and continuous improvement.

Deliverable(s)
- Best practices provided

**Evaluation Comments:** At the end of Project Year 3, AMTEC reported the completion of additional case studies at Patrick Henry College, Shelton State Community College, and Worcester Technical High School. In January 2017, AMTEC provided the Executive Summary to SCATE Inc., identifying the following case study sites: Patrick Henry Community College, Shelton State Community College, Macomb Community College, Sinclair Community College, St. Phillips Community College, Rio Hondo Community College, and Worcester High School.

The evaluator notes AMTEC’s presentation and dissemination efforts at numerous conferences over the life of the project, including Association of Career and Technical Education (ACTE) Visions, American Technical Education Association (ATEA), High Impact Technology Exchange Conference (HI-TEC), National Alliance of Workforce Solutions, National Career Pathways Network Conference, NSF ATE PI Conferences, and SkillsUSA. Most recently, AMTEC reported that it is planning a Kentucky statewide meeting on Best Practices at the National Level regarding its advanced and dual credit options.

SCATE Inc. regards this deliverable as having been attained.

---

2.4 Integrate automotive service technology track into the AMTEC Career Pathways model.

Deliverable(s)
- Five (5) automotive service technology case studies to serve as models

**Evaluation Comments:** In early 2012, case studies were completed for Alamo Colleges, Lansing Community College, the FLATE program (Florida), Kentucky/Toyota, and Ivy Tech (Indiana). Under AMTEC II, five additional sites (Patrick Henry College; Shelton State Community College; Skyline College; Spartanburg Community College/BMW Manufacturing Company, LLC; and Worcester Technical High School) were identified for manufacturing career pathways case studies. AMTEC reported the completion of additional case studies during Project Year 3 at Patrick Henry College, Shelton State Community College and at Worcester Technical High School. AMTEC compiled and shared the Executive Summary of this second round of case studies with the evaluator in early January 2017. Both sites integrate the automotive service technology track into the AMTEC Career Pathways model.

SCATE Inc. regards this deliverable as having been attained.
Goal 3: Expand the AMTEC instructional and industry-endorsed collaborative model for the AMTEC partners to grow, sustain and replicate within other industry sectors

3.1 Provide enhanced Train-the-Trainer workshops and other professional development workshops for faculty that address instruction innovation, including industry engagement, accelerated learning, and competency based instruction.

Deliverable(s):
- Two (2) Train-the-Trainer sessions per year (6 total)

Evaluation Comments: During Project Year 3, SCATE Inc. engaged AMTEC partners in interviews, which included questions pertaining to Train-the-Trainer workshops (knowledge of, participation in, benefits of). Of the combined nine new and existing academic and industry partners interviewed, only the four existing academic partners had any knowledge of the workshops at that time. Although SCATE Inc. has not been able to verify the offering of any AMTEC II Train-the-Trainer workshops, interviews with the AMTEC leadership team during the same time as the partner interviews revealed that workshop participants regard the workshops as beneficial. Members of the AMTEC leadership team also conveyed their sentiments regarding the need for a change in the workshop pedagogy. It should be noted that the AMTEC deliverables portal classified “monthly instructor professional development webinars” as offerings to satisfy this deliverable. SCATE Inc. questions the effectiveness of the professional development webinars. For example, invitations were sent to 21 faculty regarding the April 5, 2016, AMTEC professional development session. Of that number, five affirmative responses were received, but no one attended the webinar.

During the no-cost-extension year, AMTEC continued offering professional development sessions. Attendance/participation continued to be low but reported by AMTEC as “helpful” to those attendees who availed themselves of the offerings. As best SCATE Inc. can determine and based on AMTEC Weekly Call Meeting Notes, during the period from June 1, 2016-March 15, 2017, ten participants attended AMTEC professional development sessions. Weekly Call Meeting Notes also indicate that as of January 30, 2017, “working with the new LMS has elicited an array of responses [prompting AMTEC] to host 2-3 webinars/week. At this point, we have worked with 20 people and 13 colleges with active students enrolled in the system.”

While the AMTEC-reported approach to attaining this deliverable changed direction from AMTEC’s initial implementation to now, the evaluation team advises consideration of new strategies to meet faculty development objectives going forward.

SCATE Inc. regards this deliverable as having been partially attained.

3.2 Provide faculty and staff with quarterly newsletters that impact student awareness and success, curriculum and instruction, and issues related to advanced manufacturing trends.

Deliverable(s):
- Develop and provide web content to support student awareness and success, curriculum and instruction, and explore issues related to advanced manufacturing trends [Note: this deliverable replaces a quarterly online newsletter, a deliverable that has changed as discussed in Table 3.]
Evaluation Comments: According to AMTEC II, the decision was made not to create the newsletter. Instead, information-seekers would be directed to the AMTEC website. AMTEC indicated that Google analytics would be run at the end of each year to determine the extent of interest sought via the website. At this time, SCATE Inc. does not have enough information to assess impact or success for the current outreach and dissemination strategy. SCATE Inc. evaluators earlier acknowledged receipt of an AMTEC II line chart in response to its request for information, but communicated to the AMTEC leadership team that the chart needed additional explanation and/or clarification to support evaluation. Further clarification was not provided. During the March 9, 2017, conference call with AMTEC, SCATE Inc. was informed that Google analytics to track website visitors had not been run during the no-cost extension year. Although personnel changes within the AMTEC II staff over the past year have contributed to some data capture challenges, data usage and analysis charts for the website were provided in AMTEC’s reporting materials to the 2017 NVC.

SCATE Inc. is without sufficient information to verify or evaluate AMTEC’s implementation and attainment of this deliverable.

3.3 Develop a clearinghouse of media kits for faculty and students that grow and replicate the AMTEC model.

Deliverable(s):
- Online clearinghouse of media kits or templates

Evaluation Comments: During Project Year 2, AMTEC informed SCATE Inc. of its decision to move implementation of this activity to Project Year 3. In its Year 2 Evaluation Report, SCATE Inc. commented that earlier implementation of this activity might have been of greater benefit to AMTEC II. Nonetheless, and as captured on the deliverables portal, a considerable amount of work was done in creating the media kit, albeit completed within the last six months of AMTEC II. Subsequent to the 2016 National Visiting Committee Meeting where toolkit contents were described, AMTEC reported planned enhancements to this deliverable. A screenshot of the contents of the Media Kit appears as Figure 3:

![Media Kit Contents](image)

Figure 3. Media Kit Contents

Due to the delayed completion of this deliverable, the benefit to users has not been explored. However, evaluators consider this deliverable as being attained.
3.4 Host AMTEC College and Industry Academies that expand participation and sustain the Center.

Deliverable(s):
- Two (2) academies per year (6 total) related to automotive manufacturing
- One (1) academy per year related to auto service technology

Evaluation Comments: During Project Year 2, AMTEC indicated that information on the AMTEC website regarding the Academies was up to date. However, the most recently listed Academy on the website occurred in 2013; a few others are listed without dates. AMTEC II did provide links to Academy information but the links pointed to survey information from November 2013 and a copy of the survey template. SCATE Inc. evaluators are unable to determine whether academies occurred in 2014 and 2015 based on provided information. Additionally, it is difficult to determine which academies emphasize “manufacturing” versus “auto service technology.” The AMTEC II team recently informed SCATE Inc. evaluators of its decision to implement this deliverable during Project Year 3 by visiting the individual colleges for the purpose of providing technical assistance. Although a new strategy of simultaneously working with administrators on implementation issues and instructors on the delivery of the curriculum seemed to be emerging, evidence of implementation of this strategy was neither apparent nor reported on the deliverables portal at the end AMTEC II Year 3. Instead, the portal identified the Delphi Academy (April 4-5, 2016) as evidence of implementing this deliverable. However, as a primary strategy to encourage implementation, this work appears to have been lagging expectations.

During the no-cost extension period, the AMTEC II team revisited its decision to implement this deliverable, deciding to do so by visiting the individual colleges and/or providing professional development sessions for the purpose of providing technical assistance.

Using information presented during AMTEC II Weekly Conference Calls, the SCATE Inc. evaluators learned of technical assistance having been provided to the following AMTEC II partner colleges in the identified formats during the no-cost extension period:

- Reliability and Maintainability Boot Camp (November 11-12, 2016): attendees from Alabama, Kentucky, Michigan, and Virginia
- New Users Professional Development Webinar (January 17, 2017): attendees from Tennessee College of Applied Technology and St. Phillips Community Colleges

Other sessions were noted as planned but either had no attendees or had yet to be finalized. It remains difficult for SCATE Inc. to determine which sessions emphasized “manufacturing” versus “auto service technology.”

SCATE Inc. regards this deliverable as having been partially attained.

3.5 Increase partnerships by at least 25% and replicate in at least one additional industry sector and/or ATE Center.

Deliverable(s):
- Recruit eight (8) new partner colleges
Evaluation Comments: SCATE Inc. reviewed multiple sources of AMTEC II partnership information, including the AMTEC II website and partner MOUs/lists accessible via the AMTEC II deliverables link provided to the evaluators. An analysis across all available resources indicated discrepancies in AMTEC II partnership information, which prohibited the evaluators from confirming an accurate number of new college and industry partnerships attributable to AMTEC II. However, during AMTEC II Project Year 2, AMTEC informed SCATE Inc. evaluators of four new college and two new industry partners attributed to AMTEC II: Metropolitan Community College (Missouri), Northwest State Community College (Ohio), Patrick Henry Community College (Virginia), the University of Phoenix, Con-Agra Foods (Ohio), and Eastman (Virginia). Also, Murray State University presented its MOU to AMTEC during the 2017 NVC meeting. In SCATE Inc.’s review of information pertaining to AMTEC II Project Year 3, evaluators noted that all of the colleges and industry partners that AMTEC indicated as new in Project Year 2 are now classified as “inactive.” As of this report, AMTEC reports having partners in 18 states. However, the evaluators still cannot definitively confirm the number of new college and industry partnerships specifically attributable to AMTEC II. Original AMTEC partners received grant support for their involvement, whereas college partners for AMTEC II have not received financial support for curriculum implementation or other types of engagement but have had access to an increasingly complete AMTEC curriculum with assessments. Evaluators suggest that AMTEC could benefit from providing clearer definitions of partnerships in the context of this body of work. AMTEC has dedicated partners exhibiting consistent and very high levels of engagement who should, perhaps, be classified differently than partners who contribute less and use fewer AMTEC products.

SCATE Inc. considers this deliverable as being partially attained.

3.6 Develop a comprehensive public relations strategy for the purpose to support growth, sustainability and replication of the AMTEC model on a national scale.

Deliverable(s):
- Enhanced website, enhanced use of social media, AMTEC View Book for college administrators and government, and marketing related to national conferences

Evaluation Comments: Enhancements to the AMTEC website are evident, but issues remain as the website is transitioned to serve as the primary outreach strategy for AMTEC II. Although AMTEC provided evidence of enhancement to its website (e.g. addition of Career tab to the main navigation and Partner list updated and categorized) and increased use of social media, SCATE Inc. was informed that the View Book would be developed during Project Year 3. However, the View Book remains in development at the time of this report. SCATE Inc. evaluators also questioned why a public relations strategy was not developed earlier during the project’s implementation in order to provide maximum benefit to the project. AMTEC provided evidence of the website’s traffic to the evaluators. Data show spikes in website traffic in early September 2014 (prior to website enhancements) and in early January 2016. Without reasons to support the spikes and/or any other information, SCATE Inc. is unable to evaluate the effectiveness of the website and its enhancements. SCATE Inc. expresses further concern regarding the extent to which the website has been maintained and updated in a timely manner. The evaluators are still unable to reconcile the number of states in which active AMTEC partnerships are located, based on partnership information provided on the website.

SCATE Inc. is unable to verify with certainty the current number of active partners and is unclear about the extent and effectiveness of website “enhancements,” and thus considers this deliverable as being only partially attained.
3.7 Provide site specific technical assistance to create individualized career pathways and resource mapping based on local dynamics and need.

Deliverable(s):
- Individualized career pathway technical assistance clearinghouse, protocols and task force

Evaluation Comments: During Project Year 2, AMTEC II informed SCATE Inc. that business cards provided by individuals with interest in AMTEC are scanned into a database and that contacts are emailed when AMTEC II presentations are geographically close to them or relevant to their needs. During Project Year 3, the AMTEC II deliverables portal was updated to include a list of meetings related to this objective. SCATE Inc. review of the business card process and the roster of meetings did not enable evaluators to discern if either the business card process or the meeting list is consistent with the “individualized” focus of the deliverable and meets the “site specific” intent of the overarching objective, which is to “provide site specific technical assistance to create individualized career pathways and resource mapping based on local dynamics and need.” During the no-cost extension period, AMTEC reported its provision of “site specific technical assistance” by way of bi-weekly professional development sessions and attended by partners as needed. Yet, evidence does not exist to support that the provided technical assistance “created individualized career pathways and resource mapping.”

SCATE Inc. regards this deliverable as having been partially attained.

Goal 4: Drive performance improvement through the use of performance measures that systematically align AMTEC organizational direction and resources

4.1 Update and revalidate the industry defined occupational standards required by industry.

Deliverable(s):
- Revised Delphi Study

Evaluation Comments: During Project Year 3, AMTEC informed SCATE Inc. that the industry-defined occupational standards by industry would be updated and revalidated through a research-based review process—the Delphi 2. AMTEC shared updates and findings at the Delphi Academy (April 4-5, 2016) and during the 2016 NVC meeting (April 12-13). Documentation of the Delphi enabled SCATE Inc. to consider this deliverable as having been attained, as indicated in SCATE Inc.’s presentation during the 2016 AMTEC NVC meeting. During AMTEC’s no-cost extension period, the AMTEC leadership team engaged Delphi participants for the purpose of evaluating Delphi results and to determine curriculum needs. Representatives from Nissan and Pellissippi Community College participated, describing the curriculum as being 97% in alignment, but requested the following changes: “beefing up current content,” eliminating laser etching, and including welding content. Evaluators have observed that the AMTEC project team takes action immediately upon receipt of such information, and that industry and subject matter experts are quickly engaged to help the AMTEC team address such items.

SCATE Inc. regards this deliverable as having been attained.
4.2 Systematically improve student and stakeholder performance by collecting, analyzing and sharing student/candidate performance, persistence, and employment measures through the AMTEC curriculum and career pathway.

Deliverable(s):
• Bi-annual reports that contain dashboard results on student and stakeholder performance with strategic action steps taken that document improved student and stakeholder performance

Evaluation Comments: Although SCATE Inc. evaluators recognized that this was to be an ongoing activity, concerns existed regarding data capture. AMTEC provided SCATE Inc. with a link to an enrollment sample (6 institutions), but documents in the link were not dated, which made it difficult for SCATE Inc. to determine if data contained in the documents were cumulative. Also, SCATE Inc. was not able to ascertain to what extent, if any, numbers contained in the provided data correlated with data presented in the AMTEC by the Numbers documents.

AMTEC also provided a document that identified student grades by modules, which didn’t enable definitive conclusions pertaining to improved student performance. Additionally, AMTEC provided UI wage data for a sample of AMTEC graduates from Kentucky colleges. SCATE Inc. remains unclear of the period of time covered by the provided data and cannot assume that the provided data are reflective of the larger number of AMTEC participants. Having data for students in one implementation state, however, is a good start and demonstrates that it is possible to capture this type of data to answer questions about graduates. During the no-cost extension period, AMTEC made significant progress in developing a tracking matrix – creating the “AMTEC Moodle 3.1 LMS and AMTEC Decision Support System.” During the no-cost extension year, the AMTEC team has made notable progress in improving data capture, data labeling, and data reporting.

SCATE Inc. regards this deliverable as having been attained.
EVALUATION

SCATE Inc. has the primary responsibility for evaluating AMTEC II, which included the implementation of project monitoring and evaluation strategies to determine the effectiveness and success of AMTEC II. SCATE Inc. evaluated AMTEC II activities utilizing a mixed-method design including both qualitative and quantitative methods and formative and summative feedback. These methods were employed to define and describe project outcomes and were discussed in interim and annual project reports.

The evaluation process was driven by the following evaluation question:

To what extent has AMTEC facilitated the pathway for target groups to enter the automotive industry, provided industry with a well-trained sustainable pool of employees capable of advancing automotive manufacturing in the United States, and expanded the AMTEC collaborative model for replication within other industry sectors?

To aid in formulating a response to the evaluation question, SCATE Inc. initiated multiple data collection methods and engaged with AMTEC II, its partners, and student users of the AMTEC curriculum in a variety of ways. In addition to routinely “meeting” with the AMTEC II leadership team either in person or via weekly conference calls, SCATE Inc. conducted site visits and interviews with college and industry partners, observed AMTEC-sponsored events, and engaged AMTEC curriculum student-users in a focus session, and attended NVC meetings.

Materials included in Appendices A, D, E, and G of this report further define and describe SCATE Inc. evaluation methodologies for AMTEC II.

SCATE Inc. also analyzed AMTEC strategies to facilitate evaluation assessment regarding the success of AMTEC II. The AMTEC Director of Assessment and Evaluation (a consultant position) utilized strategies which included student module testing and Delphi studies. Appendix F contains evidence of this work which assisted in guiding SCATE Inc.’s evaluation of AMTEC goals and deliverables.
CONCLUSIONS AND UNANTICIPATED OUTCOMES

Conclusions

SCATE Inc. applauds efforts employed by the AMTEC leadership team in implementing AMTEC II and in expanding AMTEC’s impact as a National ATE Center focusing on automotive manufacturing and automotive service technology.

Project evaluation was guided by the following overarching evaluation question:

To what extent has AMTEC facilitated the pathway for target groups to enter the automotive industry, provided industry with a well-trained sustainable pool of employees capable of advancing automotive manufacturing in the United States, and expanded the AMTEC collaborative model for replication within other industry sectors?

Specific goals and evaluation of AMTEC’s attainment of those goals are stated below:

- **Goal 1:** Implement industry-endorsed, advanced curriculum AMTEC AAS degree program to increase student exposure to critical thinking and problem-solving skills. [Evaluation: Fully attained].

- **Goal 2:** Institutionalize the AMTEC Career Pathway Model with current AMTEC colleges and their secondary school and industry partners. [Evaluation: Fully attained].

- **Goal 3:** Expand the AMTEC Career Pathway Model with current AMTEC colleges and their secondary school and industry partners. [Evaluation: Partially attained].

- **Goal 4:** Drive performance improvement through the use of performance measures that systematically align AMTEC organizational direction and resources. [Evaluation: Fully attained].

SCATE Inc. has documented evidence to support AMTEC’s attainment of all deliverables associated with project Goals 1, 2 and 4. Minimal work remains to be completed and/or documented for Goal 3 deliverables. Even though not every goal was completed in its entirely as originally proposed, the evaluation team has observed that the AMTEC team consistently invests the greatest amount of their time and effort in areas that have the most direct impact on students and workforce development for employers and in ensuring that educators and industry know about and have access to AMTEC curriculum modules and assessments.

The evaluators would be remiss in not also noting synergistic and complementary activities during the funding period. For example, although not responsive to a particular project goal, AMTEC participated in SkillsUSA—where some competing students used AMTEC modules in their courses of study. Further evidence of AMTEC’s presence and impact is evidenced by the ripple effect of requests for AMTEC presentations by attendees at conferences and meetings where the AMTEC model was presented.

Usually, the question of project sustainability is a primary consideration, especially as the project’s funding and no-cost extension periods near an end. At the end of AMTEC Year 3, SCATE Inc. viewed AMTEC’s association with Purdue University, developer of the module simulations, as an opportunity...
ripe with possibilities for AMTEC sustainability. More recently, the state of Kentucky was awarded $2 million to improve career education. SCATE Inc. contends that this may be an opportunity for AMTEC to seek additional collaboration as a partner in projects funded to others. AMTEC’s partnership with FANUC Robotics is also promising for sustainability. FANUC manufactures the AMTEC-designed trainer that is in use where the AMTEC curriculum is being delivered with a revenue-sharing agreement. In addition, AMTEC has in place a payment system for delivery of instructional modules and assessments that has now been used for a number of years.

Unanticipated Outcomes

It is not unusual for funded projects to generate unanticipated outcomes, and AMTEC II is no exception. Based on comments generated from SCATE Inc.’s interactions and interviews with AMTEC partners, the following items discuss unanticipated outcomes of AMTEC II:

- Given the rural location of one AMTEC academic partner, Somerset Community College, the partner views AMTEC as its “industry” partner. AMTEC has helped Somerset Community College align its curriculum to industry needs and has also rendered assistance that contributed to the success of the Industrial Maintenance Machine program at the college. This includes employment of Somerset program completers by some of the larger industry partners of AMTEC.

- AMTEC has been successful in expanding the reach of its partners beyond the automotive manufacturing and automotive service areas. AMTEC partnership expansion now includes representation from the aerospace, agricultural, chemical, food, and tool industries.

- As a result of AMTEC’s leadership in Career Pathway development, Danine Tomlin, Executive Director, assumed the responsibility as Chair of the Best Practices and Solutions Subcommittee of the Kentucky Workforce Innovation Board.

Overall, the ultimate impact and success of AMTEC II is measured by the availability of a sufficient number of multi-skilled, AMTEC-prepared technicians available for industry jobs. Although the number is uncertain, there is quantitative and qualitative evidence that AMTEC has made a notable contribution to the preparation of technicians with industry-validated skills that would not otherwise have been available for the U.S. workforce.
APPENDIX A

Evaluation Plan and Logic Model
AMTEC II Evaluation Plan

SCATE Inc. is a non-profit company whose specialty is the evaluation of STEM-based workforce development projects, primarily those administered by two-year technical and community colleges nationwide. SCATE Inc. is providing external evaluation services for the Kentucky Community and Technical College System’s AMTEC II national ATE Center funded by the National Science Foundation project currently entering year two of an anticipated three-year grant life. The SCATE Inc. team is replacing the Community College Resource Center as the evaluator for this project. The SCATE Inc. evaluation will be guided by this overview and logic models for both the project and evaluation plan.

Quantitative and qualitative data will be collected and used to discover the extent to which KCTCS’s AMTEC II Project meets the goals and expectations of the project. Data collection strategies will maintain consistency with, and build upon the purpose and focus of, previous evaluations. Formative evaluation techniques will guide prospective improvement, and summative evaluation will provide retrospective clarity regarding project performance, outcomes, and impact.

Four main goals guide the AMTEC II project and provide direction for SCATE Inc. evaluative and data collection strategies:

1. Develop and implement industry-endorsed advanced curriculum and certificates beyond an AAS degree.
2. Institutionalize the AMTEC Career Pathway model with current partners.
3. Expand the AMTEC instructional and industry-endorsed collaborative model.
4. Foster an environment of evidence-based decision-making using learning analytics to sustain and improve performance while systematically aligning AMTEC direction, resources and outcomes.

The evaluation questions below served as the foundation and functional guide for the formative and summative evaluation components.

1. What deficiencies in the AMTEC curriculum were identified using gap analysis and the Delphi process, and which courses and modules were successfully developed or updated in response to those needs?
2. Was a virtual integrated manufacturing simulator developed, and what impact did it have on student performance?
3. What enhancements to the Career Pathway model, including additional case studies, the development of a tracking matrix, and the integration of an automotive service technology track were accomplished?
4. To what extent was the AMTEC collaborative model expansion achieved, and what impact did it have on the growth, sustainability, and replicability of the model within other industry sectors?
5. What barriers to expansion were identified and how were they overcome?

6. Were deficiencies in student and stakeholder performance identified and addressed through the use of Learning Analytics?

7. Were the project activities responsible for systematically improving the effectiveness, efficiency, engagement and satisfaction among AMTEC students and stakeholders?

Data Collection and Analysis

Project success is determined by the extent to which the activities, outcomes and achievements contribute to AMTEC’s overarching goal of stimulating, facilitating, and supporting the preparation of highly skilled technicians in automotive manufacturing and service industries nationwide. The SCATE Inc. evaluation will emphasize continuity with past strategies and findings, offer formative feedback to track progress, and provide a summative judgment of project effect. Quantitative data sources will include project performance records, previous evaluation findings, and student and faculty/staff surveys. Qualitative data sources will include interviews, observations, focus groups, and participant surveys.

Goal 1 incorporates the guidance of a panel of subject matter experts. They are tasked with judging the extent to which the project curriculum incorporates industry-endorsed certificates above and beyond current AMTEC AAS requirements. Project records, personnel interviews, and curriculum components will be consulted to determine whether a gap exists between industry recommendations and curriculum components, measure the extent to which those gaps are diminished by curriculum alterations, measure differences in the performance and perspectives of the project participants, and report the data for use in constructing new project improvement strategies.

Goal 2 is accomplished in part by continuing to expand the collection of AMTEC Career Pathway case studies. Important sources of data include institutional and project records, performance reports, and opinion surveys (gathered from students, faculty, staff and administrators).

Achievement is also measured based on the number of best practices recommended for implementation at each partner site versus the number of best practices actually implemented. Finally, project records will be consulted in order to compare the integration of an automotive service industry track into the AMTEC Career Pathways model.

Success for Goal 3 involves the expansion of AMTEC’s collaborative model in a way that encourages growth, sustainability and replication of the model within other industry sectors. Train-the-Trainer workshops, newsletters, faculty and student media kits, AMTEC Academies, planned replication in new industry sectors, a comprehensive public relations strategy, and technical support for individualized career advising and local asset mapping. Project attendance records, website traffic monitoring, opinion survey responses, and records of project resource allocation and effect are appropriate for making a determination of goal achievement.

Goal 4 success will be demonstrated by evidence that shows an increase in project performance that is based on a systematic alignment of AMTEC’s organizational direction with available resources.
# AMTEC II EVALUATION PLAN LOGIC MODEL

(Version 4a)

## Goal 1: Implement industry-endorsed, advanced curriculum AMTEC AAS degree program to increase student exposure to critical-thinking and problem-solving skills.

<table>
<thead>
<tr>
<th>AMTEC Activities/Deliverables</th>
<th>Evaluation Questions</th>
<th>Data to be Collected</th>
<th>Methodologies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2 Analyze data from AMTEC Delphi to identify advanced topics related to automotive manufacturing and service not already included in the current AMTEC curriculum.</td>
<td>• What coverage gaps exist in the current curriculum, and which can be filled using available resources?</td>
<td>• Current AMTEC Curriculum&lt;br&gt;• AMTEC Delphi results&lt;br&gt;• Worksheets for curriculum changes by module&lt;br&gt;• Additions made to auto service curriculum (e.g. hybrid)</td>
<td>• Review of documentation and verification of activity.</td>
</tr>
<tr>
<td>1.3 Develop scenarios for each module that challenge students to accomplish the most common and important maintenance and troubleshooting procedures and program these scenarios in the virtual integrated manufacturing simulator so that students have unlimited opportunities for practice.</td>
<td>• Is there evidence of student skill attainment in maintenance and troubleshooting upon completion of AMTEC modules?&lt;br&gt;• Is there evidence of enhanced troubleshooting skills among students who use the virtual integrated manufacturing simulator after randomized defaults are added.</td>
<td>• List of common industry-identified maintenance and troubleshooting faults.&lt;br&gt;• Crosswalk between identified faults and modules where specific faults are addressed.&lt;br&gt;• End-of-module assessment scores (and labs?) by course prior to addition of simulations (created by Purdue University) and thereafter</td>
<td>• Document review to verify fault identification and alignment of new simulations within modules.&lt;br&gt;• Analysis of end-of-module student assessment scores prior to and after addition of simulations.&lt;br&gt;• Future study (dependent on timing of completers entering the workforce after simulations are implemented): industry surveys or interviews to determine the degree to which AMTEC certified candidates (students/employees) are demonstrating advanced maintenance and troubleshooting skills as delivered in AMTEC content.</td>
</tr>
<tr>
<td>1.4 Develop and Implement a Virtual Manufacturing Simulator delivered online to allow students to use an online environment to learn and practice maintenance and troubleshooting of integrated manufacturing systems.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• To what extent has an integrated manufacturing simulator learning experience for maintenance and troubleshooting of integrated manufacturing systems been successfully translated to and delivered across the curriculum in an online, virtual environment?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Modules that incorporate virtual faults within the curriculum designed to allow students to practice maintenance and troubleshooting of integrated manufacturing systems.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Review of modules to verify the extent to which virtual faults have been incorporated to allow students to practice maintenance and troubleshooting of integrated manufacturing systems.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1.5 Implement a data-driven change control process for updating the digital lessons to improve their effectiveness.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• What processes were implemented?</td>
</tr>
<tr>
<td>• What data were necessary for successful process implementation?</td>
</tr>
<tr>
<td>• In what ways have digital lessons been improved as a result of implementing the data-driven change control process?</td>
</tr>
<tr>
<td>• List of expert-recommended, data-driven recommendations for curriculum additions.</td>
</tr>
<tr>
<td>• Documents outlining process for prioritizing courses for review and changes to be made.</td>
</tr>
<tr>
<td>• Scheduled sequence of courses that are scheduled for review each year.</td>
</tr>
<tr>
<td>• List of subject-matter experts by module (those who will be responsible for making content changes).</td>
</tr>
<tr>
<td>• Documents reflecting progress toward implementing digital lesson updates.</td>
</tr>
<tr>
<td>• Review of change-control process and worksheet from which the curriculum undergoes continuous improvement (evaluation of Process Improvement Cycle).</td>
</tr>
</tbody>
</table>
### Goal 2: Institutionalize the AMTEC Career Pathway model with current AMTEC colleges and their secondary school and industry partners.

<table>
<thead>
<tr>
<th>Activities</th>
<th>Evaluation Questions</th>
<th>Data to be Collected</th>
<th>Methodologies</th>
</tr>
</thead>
</table>
| 2.1 Expand the AMTEC “Career Pathway Case Study” by identifying and including at least five additional successful automotive/manufacturing career pathway models with corresponding educational requirements. | • How many, and which models were chosen?  
• Are all of the newly included models verifiably successful?  
• Are all of the new models accompanied by corresponding educational requirements? | • List of programs nominated for inclusion in additional case studies.  
• Case study methodology template.  
• Automotive/Manufacturing Career Pathways case studies. | • Review of project records and documentation to verify the development of at least 5 additional pathways models as case studies.                                                                                                                                 |
| 2.2 Develop a tracking matrix to identify student’s pathway selection to determine the success rate of the selected pathway model and certificates acquired from secondary to post-secondary; from post-secondary to four-year college/university; and/or employment. | • Was an exhaustive and inclusive tracking matrix developed?  
• Were data gathered that are able to accurately reflect and/or predict student success rates by pathway model? | • The matrix developed to identify student’s pathway selection to determine the success rate of the selected pathway model and certificates acquired from secondary to post-secondary; from post-secondary to four-year college/university; and/or employment.  
• One or more samples of a populated matrix. | • Review matrix template.  
• Review sample populated matrix. |
| 2.3 Disseminate best practices to implement site by site as well as Program Excellence Plans (case studies) based on the review of the literature, best practices, and continuous improvement. | • In what ways are best practices and Program Excellence Plans (case studies) for career pathways being disseminated and to whom? | • Executive Summary of past five case studies
• List of past presentations/workshops (with audiences identified) made on career pathways.
• List of scheduled presentations/workshops (with audiences identified) made on career pathways.
• Examples of institutions or organizations that are implementing career pathways based on AMTEC model(s). | • Review and verify project data related to dissemination of best and Program Excellence Plans (case studies). |

| 2.4 Integrate automotive service technology track into the AMTEC Career Pathways model. | • Was Automotive Service Technician (AST) track integrated successfully into the AMTEC Career Pathways model? | • AMTEC Career Pathways Models that specifically address the Automotive Service Technician pathway. | • Review of project records and documentation to verify the development of one or more additional pathways models as case studies for the Automotive Service Technicians. |
**Goal 3: Expand the AMTEC instructional and industry-endorsed collaborative model for the AMTEC partners to grow, sustain and replicate within other industry sectors.**

<table>
<thead>
<tr>
<th>Activities</th>
<th>Evaluation Questions</th>
<th>Data to be Collected</th>
<th>Methodologies</th>
</tr>
</thead>
</table>
| 3.1 Provide enhanced Train-the-Trainer workshops and other professional development workshops for faculty that address instructional innovation, including industry engagement, accelerated learning, and competency based instruction. | • How many workshops were provided, and at which locations?  
   • Was each workshop topically relevant to a broad audience?  
   • What was the attendance at each workshop?  
   • Did the workshops have a positive effect on the growth, sustainment, and replicability of the collaborative model? | • Roster of workshops including dates and locations  
   • Workshop curriculum/content  
   • Roster of participants  
   • Completed workshop surveys/evaluations  
   • Source data used by project to create AMTEC by the Numbers | • Review of documentation and verification of activities  
   • Analyze participants’ workshop surveys/evaluation forms |
| 3.2 Provide stakeholders with information via the autoworkforc.org website to impact student awareness and success, curriculum and instruction, and publicize issues related to advanced manufacturing trends. | • Has the AMTEC website been updated, reconfigured, and populated with information in a way that impacts student awareness and success, curriculum and instruction, and issues related to advanced manufacturing trends? | • Google Analytics and year-to-year reports  
   • Event tracking reports (prior to, and within a week following the event)  
   • Survey responses, interviews or similar feedback related to the effectiveness of the AMTEC website in achieving objective 3.2 | • Review Google Analytics to determine and document the extent to which information is being disseminated and accessed  
   • Review event tracking reports to determine impact of event  
   • Analyze survey and/or interview responses to capture the website’s impact on stakeholders |
| 3.3 Develop a clearinghouse of media kits for faculty and students that grow and replicate the AMTEC model. | • Was a clearinghouse developed?  
• To whom was access to the clearinghouse made available, and of those, how many utilized the resource and in what manner? | • List of locations/users accessing and utilizing the AMTEC media kits.  
• Collect project documentation of those who use the AMTEC media kits for purposes such as identifying AMTEC as a resource in newly-submitted grants. | • Review and verify lists and project documentation to determine potential impact on AMTEC sustainability |
| 3.4 Host AMTEC College and Industry Academies that expand participation and sustain the center. | • Which Academies were hosted, what was the rate of participation, and did they have an effect on the sustainability of the center? | • Roster of Academies including dates and locations  
• Academy curriculum/content  
• Roster of participants  
• Completed Academy surveys/evaluations | • SCATE will assist AMTEC in the development of Academy survey/evaluation  
• Follow-up feedback to be sent directly to SCATE for SCATE to review and chart what is good, what partners desire in the Academy, barriers to implementation, etc. |
| 3.5 Increase partners by at least 25% and replicate in at least one additional industry sector and/or ATE Center. | • Did the number of partners change (increase or decrease) during the life of the grant, and if so, by how much?  
• To what extent was replication achieved, and under what circumstances? | • AMTEC partner MOAs for original partners  
• AMTEC partner MOAs for new partners  
• CARCAM model  
• Site visit and partner interview documentation. | • Review and compare original and new partner MOAs to determine a minimum 25% increase  
• Review CARCAM model to document how AMTEC is being replicated  
• Document replication observed during site visits or described in partner interviews. |
### 3.6 Develop a comprehensive public relations strategy for the purpose to support growth, sustainability and replication of the AMTEC model on a national scale.

- Was a nationally relevant public relations strategy developed and implemented?
- Did it have a measurable effect on the growth, sustainability, or replication of the AMTEC model nationally?
- Project-developed “mind-map” showing outreach opportunities, e.g. labor markets, colleges, industries, government, etc.
- Chart depicting number of each type of outreach activities, time spent on each, and audience composition (e.g. secondary school counselors, community college faculty)
- Summary of website/social media enhancements
- Documented follow-up by prospective partners as a result of implementing the AMTEC 2 public relations strategy
- Review “mind-map” and chart to identify the extent of AMTEC 2 reach
- Review outreach summary chart and analyze for types and extent of outreach
- Document website and social media enhancements and correlate with Google analytics for AMTEC website

### 3.7 Provide site-specific technical assistance to create individualized career pathways and resource mapping based on local dynamics and need.

- What avenues of assistance were made available?
- For what organizations has site-specific technical assistance been provided?
- Which AMTEC resources were mapped to meet local dynamics and needs?
- Lists of Career Pathways events, by year
- List of consulting visits, by location
- Contact form
- Record of number of AMTEC USB (resource repository) giveaways, and to whom
- List of entities requesting additional AMTEC information
- Project documentation of site-specific resource mapping and technician assistance provided.
- Review lists, contact forms, and project documentation to determine the extent to which career pathways and resource mapping assistance has been provided
- Document the dissemination of AMTEC USB (resource repository) give-aways
### Goal 4: Drive performance improvement through the use of performance measures that systematically align AMTEC organizational direction and resources.

<table>
<thead>
<tr>
<th>Activities</th>
<th>Evaluation Questions</th>
<th>Data to be Collected</th>
<th>Methodologies</th>
</tr>
</thead>
</table>
| 4.1 Update and revalidate the industry defined occupational standards required by industry | • What changes have been initiated by industry partners to align the AMTEC curriculum with their standards?  
• To what extent have DACUM activities and other techniques employed by AMTEC provided industry input and direction to meet occupational standards required by industry? | • DACUM-guided curriculum content prior to AMTEC 2  
• Curriculum content changes implemented since AMTEC 2  
• Forms providing SME recommendations for updates and revisions  
• Project documentation of updates and revalidation of curriculum to meet occupational standards required by industry | • Review changes implemented in AMTEC curriculum and assessments since AMTEC 2  
• Review forms and process of capturing SME/industry input to strengthen the curriculum  
• Review project documentation of curriculum changes since AMTEC 2 |

| 4.2 Systematically improve student and stakeholder performance by collecting, analyzing and sharing student/candidate performance, persistence, and employment measures through the AMTEC curriculum and career pathway | • Which organization participated in the AMTEC program(s) by purchase of module seats or assessments?  
• What are assessment result gains for those who use the AMTEC curriculum and conduct pre- and post-assessments using the AMTEC assessments? | • Enrollment data by year.  
• AMTEC curriculum module completion analysis completed within project  
• AMTEC assessment scores over time as captured by project | • Review longitudinally project analysis of curriculum module completion, and assessment scores  
• Review and analyze cohort performance for AMTEC-based corporate training |
<table>
<thead>
<tr>
<th>Questions</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>How many AMTEC completers are there by module?</td>
<td>Cohort performance for AMTEC-based corporate training as reported by project and/or industry partners.</td>
</tr>
<tr>
<td>How have assessment results changed over the time as the curriculum has been strengthened?</td>
<td>Project records documenting employment success or gains for students or employees (incumbent workers) completing a program of study using AMTEC curriculum modules and/or assessments.</td>
</tr>
<tr>
<td>Is there evidence of employment success or gains or those who complete a course of study using AMTEC materials and/or assessments?</td>
<td>Training models used among AMTEC academic and industry partners that incorporate AMTEC modules, trainer, and/or assessments.</td>
</tr>
<tr>
<td></td>
<td>Review and analyze data related to employment success or gains for students or employees (incumbent workers) completing AMTEC-based program of study and/or assessments.</td>
</tr>
<tr>
<td></td>
<td>Document training/education models used among AMTEC academic and industry partners that incorporate AMTEC modules, trainer, and/or assessments.</td>
</tr>
</tbody>
</table>
APPENDIX B

AMTEC II Personnel and Key Stakeholder Responsibilities
# AMTEC II Personnel and Key Stakeholder Responsibilities

<table>
<thead>
<tr>
<th>Role</th>
<th>Individual(s)</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>National Science Foundation</strong></td>
<td></td>
<td>AMTEC II is supported by a National Science Foundation (NSF) Advanced Technological Education (ATE) Program Grant (1304600).</td>
</tr>
<tr>
<td><strong>Executive Director, AMTEC</strong></td>
<td></td>
<td>The Executive Director/AMTEC Principal Investigator (PI) oversees the work of the Center and serves as the responsible agent for the lead institution. The PI has overall financial and reporting authority to the NSF, the external evaluators, and the Strategy Board as well as broad authority over the Co-Principal Investigators (Co-PIs) regarding the project.</td>
</tr>
<tr>
<td><strong>Principal Investigator</strong></td>
<td>Danine Alderete Tomlin</td>
<td></td>
</tr>
<tr>
<td><strong>Project Manager</strong></td>
<td>Craig Hopkins</td>
<td>The Project Manager is responsible for the oversight and management of AMTEC that includes coordination of industry and college partners’ approved activities.</td>
</tr>
<tr>
<td><strong>Strategy Board</strong></td>
<td></td>
<td>The AMTEC Strategy Board (ASB) provides expertise in workforce education and industry needs and reviews the project progress advising the PI, Co-PIs, and the Project Manager on direction to accomplish the goals of the Center.</td>
</tr>
<tr>
<td><strong>Co-Principal Investigators</strong></td>
<td>Gary Saganski, Goal 1 Dr. Federico Zaragoza and Dr. Stan Chase, Goal 2 Bo Garcia, Goal 3 Dr. Kitty Manley, Goal 4</td>
<td>Co-Principal Investigators (Co-PIs) are assigned to lead or participate in each of the project goals, with normally no more than four Co-PIs identified for the project.</td>
</tr>
<tr>
<td><strong>Project Staff</strong></td>
<td>Leigh Allen and Susan Russell</td>
<td>Project staff assists the Principal Investigator, Project Manager, and Co-PIs as assigned in order to fully meet the needs of the project. Particular ongoing duties may be assigned to one or more staff members, as need dictates.</td>
</tr>
<tr>
<td><strong>Evaluation Team</strong></td>
<td>NVC and SCATE Inc.</td>
<td>AMTEC II has two evaluation teams: the National Visiting Committee (NVC) and SCATE Inc. The NVC serves the two major roles of assessing and advising. Under AMTEC II, SCATE Inc. conducts the project’s external evaluation.</td>
</tr>
</tbody>
</table>
APPENDIX C

AMTEC Academic and Industry Partners
## College and Industry Partners
*Active as of February 2017*  

<table>
<thead>
<tr>
<th>College</th>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alamo Community College District*</td>
<td>Toyota Motor Manufacturing Texas*</td>
</tr>
<tr>
<td>San Antonio, TX</td>
<td>San Antonio, TX</td>
</tr>
<tr>
<td>Bluegrass Community &amp; Technical College*</td>
<td>Toyota Motor Manufacturing Kentucky*</td>
</tr>
<tr>
<td>Lexington, KY</td>
<td>Georgetown, KY</td>
</tr>
<tr>
<td>Bridge Valley Community College*</td>
<td>Toyota Manufacturing West Virginia*</td>
</tr>
<tr>
<td>Montgomery, WV</td>
<td>Powertrain</td>
</tr>
<tr>
<td></td>
<td>Buffalo, WV</td>
</tr>
<tr>
<td>Gadsden State Community College*</td>
<td>CARCAM – ATE Center*</td>
</tr>
<tr>
<td>Gadsden, AL</td>
<td>Gadsden, AL</td>
</tr>
<tr>
<td>Henry Ford Community College*</td>
<td>Ford Motor Company*</td>
</tr>
<tr>
<td>Dearborn, MI</td>
<td>Dearborn, MI</td>
</tr>
<tr>
<td>Jefferson Community &amp; Technical College</td>
<td>Ford Kentucky Truck Plant*</td>
</tr>
<tr>
<td>Louisville, KY</td>
<td>Louisville, KY</td>
</tr>
<tr>
<td>Kellogg Community College*</td>
<td>Denso Manufacturing*</td>
</tr>
<tr>
<td>Battle Creek, MI</td>
<td>Battle Creek, MI</td>
</tr>
<tr>
<td>Lansing Community College*</td>
<td>GM Delta Township*</td>
</tr>
<tr>
<td>Lansing, MI</td>
<td>Lansing, MI</td>
</tr>
<tr>
<td>Pellissippi State Community College*</td>
<td>Aisin Automotive Casting Tennessee, Inc.*</td>
</tr>
<tr>
<td>Knoxville, TN</td>
<td>Denso Technical Training Center*</td>
</tr>
<tr>
<td></td>
<td>Knoxville, TN</td>
</tr>
<tr>
<td>Spartanburg Community College*</td>
<td>BMW Manufacturing Company*</td>
</tr>
<tr>
<td>Spartanburg, SC</td>
<td>Spartanburg, SC</td>
</tr>
<tr>
<td>Rhodes State College*</td>
<td>Lima Ford Plant*</td>
</tr>
<tr>
<td>Lima, OH</td>
<td>Lima, OH</td>
</tr>
<tr>
<td>Tennessee College of Applied Technology*</td>
<td>Nissan North America*</td>
</tr>
<tr>
<td>Murfreesboro, TN</td>
<td>Smyrna, TN</td>
</tr>
<tr>
<td>Tennessee College of Applied Technology*</td>
<td>Nissan North America*</td>
</tr>
<tr>
<td>Shelbyville, TN</td>
<td>Smyrna, TN</td>
</tr>
<tr>
<td>Chattanooga State Community College</td>
<td>Volkswagen Group of America</td>
</tr>
<tr>
<td>Chattanooga, TN</td>
<td>Chattanooga, TN</td>
</tr>
<tr>
<td></td>
<td>Regional ATE Center</td>
</tr>
<tr>
<td>Clark State Community College</td>
<td>Honda of America Manufacturing Inc.</td>
</tr>
<tr>
<td>Springfield, OH</td>
<td>Marysville, OH</td>
</tr>
<tr>
<td>College</td>
<td>Industry</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>Columbus State Community College</td>
<td>Honda of America Manufacturing Inc.</td>
</tr>
<tr>
<td>Columbus, OH</td>
<td>Marysville, OH</td>
</tr>
<tr>
<td>Cuyahoga Community College*</td>
<td>Ford Cleveland Park Engine #1*</td>
</tr>
<tr>
<td>Cleveland, OH</td>
<td>Brook Park, OH</td>
</tr>
<tr>
<td>Danville Community College*</td>
<td>Goodyear Tire and Rubber*</td>
</tr>
<tr>
<td>Danville, VA</td>
<td>Danville, VA</td>
</tr>
<tr>
<td>Everett Community College*</td>
<td>The Boeing Company*</td>
</tr>
<tr>
<td>Everett, WA</td>
<td>Everett, WA</td>
</tr>
<tr>
<td>Ferris State University*</td>
<td></td>
</tr>
<tr>
<td>Big Rapids, MI</td>
<td></td>
</tr>
<tr>
<td>Gateway Community &amp; Technical College*</td>
<td>Toyota T-TEN*</td>
</tr>
<tr>
<td>Florence, KY</td>
<td></td>
</tr>
<tr>
<td>Gateway Technical College</td>
<td>Snap-On Tools</td>
</tr>
<tr>
<td>Sturtevant, WI</td>
<td>Kenosha, WI</td>
</tr>
<tr>
<td>Henderson Community College*</td>
<td></td>
</tr>
<tr>
<td>Henderson, KY</td>
<td></td>
</tr>
<tr>
<td>Itawamba Community College</td>
<td>Toyota Motor Manufacturing Mississippi</td>
</tr>
<tr>
<td>Tupelo, MS</td>
<td>Blue Springs, MS</td>
</tr>
<tr>
<td>Ivy Tech Community College*</td>
<td>Toyota Motor Manufacturing Indiana*</td>
</tr>
<tr>
<td>Princeton, IN</td>
<td>Princeton, IN</td>
</tr>
<tr>
<td>Jackson State Community College</td>
<td>Toyota Sub-Contractors</td>
</tr>
<tr>
<td>Jackson, TN</td>
<td></td>
</tr>
<tr>
<td>Lorain County Community College</td>
<td>Honda</td>
</tr>
<tr>
<td>Elyria, OH</td>
<td></td>
</tr>
<tr>
<td>Macomb Community College – ATE Center</td>
<td>Regional ATE Center</td>
</tr>
<tr>
<td>Warren, MI</td>
<td></td>
</tr>
<tr>
<td>MAGNET (Manufacturing Advocacy and Growth Network)*</td>
<td>Cuyahoga Community College*</td>
</tr>
<tr>
<td>Cleveland, OH</td>
<td>Cleveland, OH</td>
</tr>
<tr>
<td>MEDC (Michigan Economic Development Corporation)*</td>
<td></td>
</tr>
<tr>
<td>Lansing, MI</td>
<td></td>
</tr>
<tr>
<td>Marion Technical College</td>
<td>Honda of America Manufacturing Inc.</td>
</tr>
<tr>
<td>Marion, OH</td>
<td>Marysville, OH</td>
</tr>
<tr>
<td>Metropolitan Community College</td>
<td>Ford Kansas City Assembly Plant</td>
</tr>
<tr>
<td>Kansas City, MO</td>
<td>Claycomo, MO</td>
</tr>
<tr>
<td>College</td>
<td>Industry</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Monroe Country Community College</td>
<td></td>
</tr>
<tr>
<td>Monroe Charter Township, MI</td>
<td></td>
</tr>
<tr>
<td>Mott Community College</td>
<td></td>
</tr>
<tr>
<td>Flint, MI</td>
<td></td>
</tr>
<tr>
<td>Northeast Mississippi Community College</td>
<td>Toyota Motor Manufacturing Mississippi</td>
</tr>
<tr>
<td>Booneville, MS</td>
<td>Blue Springs, MS</td>
</tr>
<tr>
<td>Northwest State Community College</td>
<td>ConAgra Foods</td>
</tr>
<tr>
<td>Archbold, OH</td>
<td>Archbold, OH</td>
</tr>
<tr>
<td>Oakland Community College*</td>
<td></td>
</tr>
<tr>
<td>Auburn Hills, MI</td>
<td></td>
</tr>
<tr>
<td>Owens Community College</td>
<td>UAW Ohio (Region 2B)</td>
</tr>
<tr>
<td>Toledo, OH</td>
<td>Maumee, OH</td>
</tr>
<tr>
<td>Patrick Henry Community College*</td>
<td>Eastman</td>
</tr>
<tr>
<td>Martinsville, VA</td>
<td>Martinsville, VA</td>
</tr>
<tr>
<td>Rock Valley Community College</td>
<td></td>
</tr>
<tr>
<td>Rockford, IL</td>
<td></td>
</tr>
<tr>
<td>Southcentral Kentucky Community &amp; Technical College*</td>
<td>General Motors Corvette Plant</td>
</tr>
<tr>
<td>Bowling Green, KY</td>
<td>Bowling Green, KY</td>
</tr>
<tr>
<td>Southern State Community College</td>
<td>Honda of America Manufacturing Inc.</td>
</tr>
<tr>
<td>Hillsboro, OH</td>
<td>Marysville, OH</td>
</tr>
<tr>
<td>Tri Rivers Career Center</td>
<td>Honda</td>
</tr>
<tr>
<td>Marion, OH</td>
<td></td>
</tr>
<tr>
<td>University of Phoenix</td>
<td></td>
</tr>
<tr>
<td>Indianapolis, IN</td>
<td></td>
</tr>
<tr>
<td>Vincennes University</td>
<td>Toyota Motor Manufacturing Institute</td>
</tr>
<tr>
<td>Indianapolis, IN</td>
<td>Princeton, IN</td>
</tr>
<tr>
<td>Western Technical College*</td>
<td>City Council of Manufacturers</td>
</tr>
<tr>
<td>El Paso, TX</td>
<td>El Paso, TX</td>
</tr>
<tr>
<td>College</td>
<td>Industry</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Monroe Country Community College</td>
<td></td>
</tr>
<tr>
<td>Monroe Charter Township, MI</td>
<td></td>
</tr>
<tr>
<td>Mott Community College</td>
<td></td>
</tr>
<tr>
<td>Flint, MI</td>
<td></td>
</tr>
<tr>
<td>Northeast Mississippi Community College</td>
<td>Toyota Motor Manufacturing Mississippi</td>
</tr>
<tr>
<td>Boonville, MS</td>
<td>Blue Springs, MS</td>
</tr>
<tr>
<td>Northwest State Community College</td>
<td>ConAgra Foods</td>
</tr>
<tr>
<td>Archbold, OH</td>
<td>Archbold, OH</td>
</tr>
<tr>
<td>Oakland Community College*</td>
<td></td>
</tr>
<tr>
<td>Auburn Hills, MI</td>
<td></td>
</tr>
<tr>
<td>Owens Community College</td>
<td>UAW Ohio (Region 2B)</td>
</tr>
<tr>
<td>Toledo, OH</td>
<td>Maumee, OH</td>
</tr>
<tr>
<td>Patrick Henry Community College*</td>
<td>Eastman</td>
</tr>
<tr>
<td>Martinsville, VA</td>
<td>Martinsville, VA</td>
</tr>
<tr>
<td>Rock Valley Community College</td>
<td></td>
</tr>
<tr>
<td>Rockford, IL</td>
<td></td>
</tr>
<tr>
<td>Southcentral Kentucky Community &amp; Technical College*</td>
<td>General Motors Corvette Plant</td>
</tr>
<tr>
<td>Bowling Green, KY</td>
<td>Bowling Green, KY</td>
</tr>
<tr>
<td>Southern State Community College</td>
<td>Honda of America Manufacturing Inc.</td>
</tr>
<tr>
<td>Hillsboro, OH</td>
<td>Marysville, OH</td>
</tr>
<tr>
<td>Tri Rivers Career Center</td>
<td>Honda</td>
</tr>
<tr>
<td>Marion, OH</td>
<td></td>
</tr>
<tr>
<td>University of Phoenix</td>
<td></td>
</tr>
<tr>
<td>Indianapolis, IN</td>
<td></td>
</tr>
<tr>
<td>Vincennes University</td>
<td>Toyota Motor Manufacturing Institute</td>
</tr>
<tr>
<td>Indianapolis, IN</td>
<td>Princeton, IN</td>
</tr>
<tr>
<td>Western Technical College*</td>
<td>City Council of Manufacturers</td>
</tr>
<tr>
<td>El Paso, TX</td>
<td>El Paso, TX</td>
</tr>
</tbody>
</table>
APPENDIX D

Supporting Evaluation Documents
### SCATE Inc. Materials Developed to Support AMTEC Evaluation

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Dated*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SCATE Inc. Project Logic Model</td>
<td>August 22, 2014</td>
</tr>
<tr>
<td>2</td>
<td>SCATE Inc. Evaluation Plan</td>
<td>August 22, 2014</td>
</tr>
<tr>
<td>3</td>
<td>SCATE Inc. Evaluation Plan Logic Model</td>
<td>August 22, 2014</td>
</tr>
<tr>
<td>4</td>
<td>SCATE Inc. Evaluation Activities for AMTEC II</td>
<td>September 15, 2014</td>
</tr>
<tr>
<td>5</td>
<td>Kick-Off Meeting materials</td>
<td></td>
</tr>
<tr>
<td>5a</td>
<td>Kick-Off Meeting Agenda</td>
<td>August 22, 2014</td>
</tr>
<tr>
<td>5b</td>
<td>SCATE Inc. AMTEC Checklist</td>
<td>August 25, 2014</td>
</tr>
<tr>
<td>5c</td>
<td>Evaluation Team PowerPoint</td>
<td>August 26, 2014</td>
</tr>
<tr>
<td>6</td>
<td>Protocol for SCATE Inc. Site Visits with AMTEC Academic Partners</td>
<td>November 11, 2014</td>
</tr>
<tr>
<td>7</td>
<td>Protocol for SCATE Inc. Site Visits with AMTEC Industry Partners</td>
<td>November 29, 2014</td>
</tr>
<tr>
<td>8</td>
<td>Manley Survey and Goal Alignment</td>
<td>January 3, 2015</td>
</tr>
<tr>
<td>9</td>
<td>AMTEC Partner Matrix</td>
<td>March 20, 2015</td>
</tr>
<tr>
<td>10</td>
<td>AMTEC Goals/SCATE Logic Model Crosswalk</td>
<td>March 23, 2015</td>
</tr>
<tr>
<td>11</td>
<td>SCATE Inc. Year 2 Annual Evaluation NCV PowerPoint Presentation</td>
<td>May 4, 2015</td>
</tr>
<tr>
<td>12</td>
<td>SCATE Inc. / AMTEC II Year 3 Planning Meeting Agenda</td>
<td>July 2, 2015</td>
</tr>
<tr>
<td>13</td>
<td>2015-16 SCATE Inc. and AMTEC Activity Timeline</td>
<td>July 25, 2015</td>
</tr>
<tr>
<td>14</td>
<td>Interview Questions for AMTEC Partners and Team Members</td>
<td>September 16, 2015</td>
</tr>
<tr>
<td>15</td>
<td>SCATE Inc. Roster of AMTEC Activities</td>
<td>November 21, 2015</td>
</tr>
<tr>
<td>16</td>
<td>SCATE Inc. Table of AMTEC Data and Information Needs</td>
<td>January 1, 2016</td>
</tr>
<tr>
<td>17</td>
<td>Focus Group Questions for Somerset Community College AMTEC Module Users</td>
<td>February 22, 2016</td>
</tr>
<tr>
<td>18</td>
<td>SCATE Inc. AMTEC Academy Survey – April 2016</td>
<td>April 1, 2016</td>
</tr>
<tr>
<td>19</td>
<td>SCATE Inc. Year 3 Annual Evaluation NCV PowerPoint Presentation</td>
<td>April 12, 2016</td>
</tr>
<tr>
<td>20</td>
<td>SCATE Inc. Preliminary Year 3 Annual Evaluation Report</td>
<td>April 21, 2016</td>
</tr>
<tr>
<td>21</td>
<td>SCATE Inc. AMTEC No Cost Extension “Needs” List and Work Timeline</td>
<td>August 2016</td>
</tr>
<tr>
<td>22</td>
<td>SCATE Inc. Final Evaluation Report</td>
<td>January 2017</td>
</tr>
<tr>
<td>23</td>
<td>SCATE Inc. Final Evaluation NCV PowerPoint Presentation</td>
<td>April 2017</td>
</tr>
<tr>
<td>Activities</td>
<td>Year 1 (7/1/14-4/15/15)</td>
<td>Year 2 (4/16/15 – 4/1/16)</td>
</tr>
<tr>
<td>---------------------------------------------------------</td>
<td>--------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Conference Calls/Emails</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Development of Evaluation Documents</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Review of Documents</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Observations (events, conferences, meetings, workshops)</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Focus Sessions with AMTEC Graduates</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Focus Session with AMTEC Module Users</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meetings with Project Leadership Team</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Site Visits/Interviews with Academic Partner(s)</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Site Visit/Interview with Industry Partner</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>
APPENDIX E

Site Visit, Partner, and Focus Group Interview Protocols
AMTEC ACADEMIC PARTNER PROTOCOL
(2014 – 2015)

College

1. How did you learn about AMTEC?

2. What is it that AMTEC offers that attracted ________ College in becoming a partner, attend the workshop, and implement (or consider implementing) the AMTEC curriculum and/or assessments?

3. When you became an AMTEC partner, what were your expectations regarding the AMTEC curriculum (trainers, modules, and assessments) vs. the reality of how the AMTEC partnership is playing out?

4. Discuss your college’s current and projected use of the modules, trainers, and assessments? Do you have industry partners who are requesting the AMTEC curriculum? If so, please identify.

5. What is ________ College’s intent to implement the AMTEC curriculum?
   a. Absolutely
   b. Highly likely
   c. Maybe
   d. Not likely
   e. Definitely will not

6. What is ________ College’s intent to use the AMTEC assessments?
   a. Absolutely
   b. Highly likely
   c. Maybe
   d. Not likely
   e. Definitely will not

7. Are the AMTEC curriculum and assessments being integrated into existing courses at your college, or are they being offered as new and/or stand-alone educational offerings?

8. Does your college have well-defined career pathways in automotive manufacturing, mechatronics, and/or automotive service? ___________________________ Do you find that these pathways are productive in guiding students into programs and employment requiring automotive manufacturing, mechatronics, and/or automotive service skills and knowledge?
What has been the influence of AMTEC on the development of your career pathways?

Are any of your career pathways based on AMTEC models (career pathways case studies) or other AMTEC “best practices”? In what ways have you found your AMTEC partnership and/or AMTEC assistance with developing career pathways useful?

9. What is the likelihood that College will purchase an AMTEC trainer if it has yet to do so?
   a. Absolutely
   b. Highly likely
   c. Maybe
   d. Not likely
   e. Definitely will not
   f. Already purchased an AMTEC trainer

10. In your opinion, what is needed to move the program forward at your college and serve industry that has not yet been provided by AMTEC?

11. Who are your suppliers for content, curriculum, and training modules for your college’s automotive manufacturing or automotive service programs? Siemens? Amatrol? Specific automotive manufacturers and dealers?

12. To what extent (none, some, largely), if any, are you using products or resources from:
   a. CA²VES (Clemson University)
   b. CARCAM (Gadsden, Alabama)
   c. CAAT (McComb CC, MI)

13. Describe the “health” of automotive manufacturing and automotive service programs at your college.

   Within each program, is enrollment increasing, decreasing, or holding steady?

   Has your affiliation as an AMTEC partner and use of the AMTEC curriculum had any impact on student enrollments? If so, what has been observed?

14. Since your involvement with AMTEC, have you experienced any automotive manufacturing or automotive service program challenges, i.e. student recruitment, student retention, equipment, etc.?

15. From your perspective, do you feel like you are receiving needed AMTEC support? If so, how? If not, what is needed?
16. How often and in what types of venues do you interact with AMTEC personnel? Describe communications between your college as an AMTEC partner and the AMTEC project staff/office.

Do AMTEC partners interact with and/or support one another?

17. Are there any other comments that you would like to provide regarding the role of AMTEC as a National ATE Center to support the production of automotive manufacturing technicians?
AMTEC INDUSTRY PARTNER PROTOCOL
(2014 – 2015)

Industry

1. When you became an AMTEC partner, what were your expectations regarding the AMTEC curriculum (trainers, modules, and assessments) vs. the reality of how the AMTEC partnership is playing out? [Note: if not obvious from their initial response, probe to determine if expectations have been met, exceeded, or not met and in what ways.]

2. For evaluation purposes, it would be helpful to know the types of AMTEC activities that [partner name] has participated in as an AMTEC industry partner. Include in your response information pertaining to the level and types of interaction that [partner name], as an AMTEC industry partner, has with students who go through the AMTEC curriculum.

3. We just discussed ways that [partner name] has participated in AMTEC. Since it takes at least two to have a partnership, let’s also look at the flip side. What has AMTEC done for your company? How has the partnership with AMTEC been of benefit to your company?

4. In your opinion, what is needed to move the program forward to better serve [partner name] that has not yet been provided by AMTEC?

5. Regarding your partnership with AMTEC, what is working especially well?

6. Regarding your partnership with AMTEC, what is not working well?

7. When evaluating employees, to what extent if any are you able to distinguish between employees who have received training via the AMTEC curriculum versus non AMTEC-trained employees? [Note: if unable to answer because first employees have just finished curriculum, ask how long they think it will take to determine the impact of AMTEC training on their business.]

8. It would be beneficial to know what types of training [partner name] staff have received regarding the instructional approaches using the AMTEC curriculum modules. To what degree do you believe that you understand the instructional approach? How was that curriculum training received or understanding achieved?

9. Since the inception of AMTEC, what has been [partner name]’s planned use of the AMTEC modules? Is that still the plan or has the plan undergone any changes? If so, why?
10. To what extent are you aware of the AMTEC “Balanced Scorecard” and other processes used by AMTEC for continuous improvement? Is ______ involved in the continuous improvement process? Please identify anything especially effective about the process? Is there anything that you think can be improved? If so, what? We’re curious to know how AMTEC processes trickle down to its partners. Is there anything that you can share with us based on your experiences? [Note: If necessary, find out if they are aware of any other continuous improvement processes that AMTEC should be considering.]

11. From your perspective, do you feel like you are receiving needed AMTEC support? If so, how? If not, what is needed?

12. How often and in what types of venues do you interact with AMTEC personnel? Describe communications between ______ as an AMTEC partner and the AMTEC project staff/office. Are your AMTEC communication methods effective? If so, what makes the AMTEC approach effective? If not, how can communications be improved?

13. Do AMTEC partners interact with and/or support one another. If so, describe how AMTEC partners interact with and/or support one another? If not, would this be helpful? If so, how would you envision this interaction and support working?

14. If you could “rewind” your experience with AMTEC, how would you do things differently, if at all?

15. To consider your partnership with AMTEC to be of maximum benefit to ______, are there changes or improvements you would recommend for AMTEC’s future work?

16. From the ______ perspective, what would be required to sustain an ongoing successful partnership between AMTEC and ______ beyond AMTEC’s National Science Foundation grant funding period?

17. Are there any other comments that you would like to provide regarding the role of AMTEC as a National ATE Center to support the production of automotive manufacturing technicians?
APPENDIX F

Curriculum Delphi
Goal 4—Assessment and Evaluation

NVC

April 12-13, 2016

110 Standards

• 2 versions of Comprehensive Test –
• 19 topic areas and 100 standards

13 courses

• 13 End-of-Course (topic level) Assessments

57 modules

• 57 pre- and 57 post-tests

110 Standards

• Aligned to Standards
• 2 versions
• Developed by Industry

13 courses (topics)

• Aligned to Subset of Standards
• 13 tests
• Developed by Industry

57 modules

• Aligned to Student Learning Outcomes
• 57 pre- and 57 post-tests
• Developed by Faculty
<table>
<thead>
<tr>
<th>Category</th>
<th>Round 1</th>
<th>Round 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automotive Manufacturer</td>
<td>51</td>
<td>32</td>
</tr>
<tr>
<td><strong>A</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMW Manufacturing</td>
<td>29</td>
<td>18</td>
</tr>
<tr>
<td>Ford Motor Company</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Ford Motor Company - Kentucky Truck Plant</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Nissan (thru Kelly services)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Nissan North America</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>Toyota Motor Manufacturing</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Toyota Motor Manufacturing Texas</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td><strong>B</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automotive Supplier</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>DENSO Manufacturing Tennessee</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Hitachi Automotive</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Takata</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>C</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aerospace Manufacturing</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Boeing</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td><strong>D</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aerospace Supplier</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Absolute Mfg./Senior Aerospace</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>AvtechTyee</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Senior Aerospace AMT</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>E</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Manufacturing</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Cascade Coffee Inc</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Clorox</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Clorox-Kingsford Manufacturing Co</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>F</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Amazon</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Darigold</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>G</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community College</td>
<td>22</td>
<td>16</td>
</tr>
<tr>
<td>Alamo Colleges</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Bluegrass Community and Technical College</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Clover Park Technical College</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Danville Community College</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Everett Community College</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Jefferson Community and Technical College</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Lansing Community College</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Pellissippi State Community College</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Rhodes State</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Somerset Community College</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Somerset Community College KCTCS</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Spartanburg Community College</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>St. Philip's College</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Western Technical College</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>H</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary school</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Kent Career Technical Center</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>I</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Ferris State University</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>76</td>
<td>50</td>
</tr>
</tbody>
</table>
APPENDIX G

External Evaluation
Automotive Manufacturing Technical Education Collaborative (AMTEC)

Systemic Change in Advanced Technological Education, SCATE Inc.

Evaluation plan based on AMTEC II Goals

Goal 1: Implement industry-endorsed, advanced curriculum and certificates beyond the current AMTEC AAS degree program to increase student exposure to critical-thinking and problem-solving skills.

Goal 2: Institutionalize the AMTEC Career Pathway model with current AMTEC colleges and their secondary school and Industry partners.

About SCATE Inc.

- Replaced the Community College Research Center (CCRC) as AMTEC II evaluator in July 2014
- Not-for-profit, 501 (c) (3) corporation, affiliated with the South Carolina ATE (SC ATE) Center of Excellence, Florence Darlington Technical College
- History of evaluating grants for the National Science Foundation, U.S. Department of Education, and the U.S. Department of Labor

AMTEC II Goals

Goal 3: Expand the AMTEC instructional and industry-endorsed collaborative model for the AMTEC partners to grow, sustain and replicate within other Industry sectors.

Goal 4: Drive performance improvement through the use of performance measures that systematically align AMTEC organizational direction and resources.

The SCATE Inc. Evaluation Team for AMTEC II

Elaine Craft, President/CEO, SCATE Inc.
Elaine.Craft@scate.org

Dr. Diana McCauley Williams, Lead Project Evaluator
dianaemccaulay@bellsouth.net

Dr. Callie Dunavin, Evaluator
cdunavin@scate.org
**Evaluation Methods**
- Mixed-method design, including both quantitative and qualitative methods
- Observation through site visits, interaction with project personnel and review of processes and deliverables
- Data and trend analysis of outcomes
- College and Industry partner feedback via surveys and interviews
- Participant feedback via focus groups

**AMTEC Partners in 18 States**

**Feedback Provided**

**Formative**
- What’s working and not working?
- What needs to be strengthened to achieve the desired outcomes?
- Ongoing review of project activities, outcomes data, and deliverables continually assessed and communicated

**Summative**
- Evidence of impact and achievement toward goal attainment and broader impacts.

**Industry**
- Industry-driven, on-going course review/curriculum updating
- Industry contribution to development of simulator
- Industry hiring and promotion of graduates
- Industry collaboration in AMTEC outreach efforts and presentations, providing tours, faculty development, and MWC
- Industry expansion beyond the scope of AMTEC

**Data**

**Curriculum**
- Follow-up Delphi Study designed to update and evaluate industry-defined occupational standards
- Instructor Curriculum Feedback Survey / New Employer Survey Reports (with pie chart graphics)
- Delivery by college, modules, lessons, questions, and error type

**Student Learning**
- Analysis of learning gains from assessments
- Moodle updated/IMS developed during the no-cost extension period
- New Graduate Survey

**Evaluation Observations and Project Outcomes**
Other Evaluation Observations and Project Outcomes

**Outreach** (Abbreviated Listing)
- Challenger Center (Louisville, KY – August 2014)
- NCPT (Lake Buena Vista, FL – October 2014; Indianapolis, IN – October 2013)
- IMTEC (Portland, OR – July 2015)
- American Technical Education Association (Orange Beach, AL – March 2016; Nashville, TN – March 2017)

**Conclusions**

- DUE 0963317 – AMTEC collaborative formed to focus on technician education for automotive manufacturing
- DUE 0903103 – AMTEC National Center focus on identifying and validates skills for automotive manufacturing technicians and creating a workforce development system
- DUE 1330460 – AMTEC II focus on refining and delivering the AMTEC curriculum and assessments, adding simulation and enhancing the curriculum with use of a simulator and the introduction of simulation and fault-based scenarios into competency-based online modules, and documenting AMTEC Center career pathways to promote institutionalization

Other Evaluation Observations and Project Outcomes

- Additional Career Pathway Case Studies, including automotive service technology
- Media Kit
- Active pursuit of sustainability opportunities

Goals Attainment ➔ Broader Impacts
(stated in proposal for AMTEC II)

- "being a strong convenor of automotive educators and the auto industry to educate technicians needed by the automotive industry"
- "providing professional development of faculty and teachers"
- "providing standards, curricula, online resources, assessments and certificates."

Unanticipated Project Outcomes

- Academic partner viewing AMTEC as an "industry partner" – helping align curriculum to industry needs and supporting program success
- Partnership expansion beyond the automotive manufacturing and automotive service areas to include aerospace, agricultural, chemical, food and tool industries
- Purdue University’s development of the AMTEC Virtual Reality Simulator

Sustainability and Future Considerations
The ultimate impact and success of AMTEC II is measured by the availability of a sufficient number of multi-skilled, AMTEC-prepared technicians available for industry jobs. There is quantitative and qualitative evidence that AMTEC has made a notable contribution to the preparation of technicians with industry-validated skills that would not otherwise have been available for the US workforce.

Questions?
Evaluation Methods
- Mixed-method design, including both quantitative and qualitative methods
- Observation through site visits, interaction with project personnel and review of processes and deliverables
- Data and trend analysis of outcomes
- College and industry partner feedback via surveys and interviews
- Participant feedback via focus groups

Active AMTEC II Partners in 12 States

Feedback Provided
Formative
- What's working and not working?
- What needs to be strengthened to achieve the desired outcomes?
- Ongoing review of project activities, outcomes data, and deliverables continually assessed and communicated

Summative
- Evidence of impact and achievement toward goal attainment and broader impacts.

Industry
- Industry-driven, on-going course review/curriculum updating
- Industry contribution to development of simulator
- Industry hiring and promotion of graduates
- Industry collaboration in AMTEC outreach events and presentations, providing tours, faculty development, and NVC

Data
Curriculum
- Follow-up Delphi Study designed to update and evaluate industry-defined occupational standards
- Much lower level of participation with second Delphi Study

Student Learning
- Analysis of learning gains from assessments
- Current LMS limits data capture and analysis
- Implementing colleges not providing data

Evaluation Findings
SCATE Inc. Interview and Focus Group Findings

Academic and Industry Partners
- Development of resources, curriculum, and assessments
- Persistence in curriculum development/refinement
- Accessibility and helpfulness of AMTEC team
- Implementing effective marketing/dissemination practices
- Challenges with for-credit vs. non-credit use

Trends ▲ Opportunity for improvement

SCATE Inc. Interview and Focus Group Findings

Student Focus Group
- Usability, content, ease of navigation
- Visual presentations within lessons
- Students want access to all modules, not just the one(s) for which they are currently enrolled
- Access / browser issues - lose work
- Need better in-module completion tracking
- Proctored testing would provide more reliable results
- Faculty do not align in-class and online work

Trends ▲ Opportunity for improvement

SCATE Inc. Interview and Focus Group Findings (continued)

AMTEC Team
- Change control process for curriculum development
- Engagement of partners via workshops, Academies, professional development sessions and less formal opportunities
- LMS and college tracking of student progress
- Marketing
- Engagement of higher level college administrators and decision-makers

Trends ▲ Opportunity for improvement

April 2016 Academy

Participant learning gains from start to end of Academy (20-14)

Other Findings
- Career Pathway Case Studies near completion
- Purdue University team on-schedule development of virtual simulations to enhance module lessons
- Active pursuit of sustainability opportunities
Questions?
Year 2 Annual Evaluation
Automotive Manufacturing Technical Education Collaborative (AMTEC)

Systemic Change in Advanced Technological Education, SCAFE Inc.

Evaluation Components
- Process
- Progress
- Outcomes

About SCAFE Inc.
- Replaced the Community College Research Center (CCRC) as AMTEC II evaluator in July 2014
- Not-for-profit, 501(c)(3) corporation, affiliated with the South Carolina ATE (SC ATE) Center of Excellence, Florence-Darlington Technical College
- History of evaluating grants for the National Science Foundation, U.S. Department of Education, and the U.S. Department of Labor

The SCAFE Inc. Evaluation Team for AMTEC II
- Elaine Craft, President/CEO, SCAFE Inc.
  Elaine.Craft@SCAFE.edu
- Dr. Diana McCauley, Lead Project Evaluator
diana.mccauley@bellsouth.net
- Dr. Caille Dunavon, Evaluator
cdunavon@midsouthbcc.edu

Evaluation Methods
- Mixed-method design, including both quantitative and qualitative methods
- Observation through site visits, interaction with project personnel and review of processes and deliverables
- Data and trend analysis of outcomes
- College and industry partner feedback via surveys, interviews, and/or focus groups
Feedback Provided

Formative
- What’s working and not working?
- What needs to be strengthened to achieve the desired outcomes?
- Ongoing review of project activities, outcomes data, and deliverables continually assessed and communicated

Summative
- Evidence of impact and achievement toward goal attainment and broader impacts.

Sophisticated course review / curriculum updating process
- Driven by industry input

Year 2 AMTEC II Highlights

Extensive Roster of Outreach Efforts (samples)
- Challenger Center (Louisville, KY – August 2014)
- NCPN (Lake Buena Vista, FL – October 2014)
- NSF ATE-PI (Washington, DC – November 2014)

Documented AMTEC Partnerships in 14 states

Nissan Maintenance Apprenticeship
- First implementation of this type
- Accomplished collaboratively with TCAT-Murfreesboro (Tennessee College of Applied Technology)
- 2-year program including 4,160
- 22 graduates (December 2014)
Year 2 AMTEC II Challenges

Recommendations

- Focus on all vs. selected deliverables
- Engage in sustainability planning
- Develop and adhere to targeted outreach plan
- Increase faculty development and flexibility
- Be diligent in adding dates to all work and data
- Plan in advance for all annual activities
- Strengthen participant tracking processes

Questions and Answers

- Public Relations Strategy
  - Postponed until project Year 3

- Participant Tracking Matrix
  - Not underway as of April 30, 2014

- Implementation of real-time, ongoing updates to the AMTEC curriculum and assessments
  - Enables products to remain relevant in meeting industry requirements

SCATE Inc. Recommendations
APPENDIX H

Simulation Development