March 29, 2016

Dr. Celeste Carter
National Science Foundation
4201 Wilson Blvd.
Arlington, Virginia 22230

Dear Dr. Carter:

As the External Evaluator, I have completed the FLATE Annual Evaluation Report for the year ending

December 31, 2015, and have enclosed it with this letter. Please contact me with any questions.

Sincerely,

Phil Centonze
Co-Founder and Managing Partner

Florida Advanced Technological Education Center (FLATE) Evaluation Report
For Year Ending December 31, 2015

Executive Summary

This report examines and evaluates organizational performance in all key areas as self-identified by FLATE goals and objectives, based on FLATE's environment and award contract, as described in Part I. This evaluation is an integral element of FLATE's Evaluation Plan. Please refer to http://www.fl-ate.org/about_us/evaluation.html, or to the annual evaluation report submitted in 2010 for a full description of that plan. Fundamentally, the evaluation plan serves two primary purposes. First, to collect evaluation data to measure the positive impact on goals of the National Science Foundation (NSF) Advanced Technological Education (ATE) Program including science, technology, engineering and mathematics (STEM) education and workforce impact, as well as the technical skills for STEM technicians and educators. Second, to collect data which satisfy FLATE's industry partners and stakeholders as to FLATE's performance and success. The FLATE evaluation plan and results assures stakeholders that FLATE operates in a manner that is consistent with industry-recognized best business management practices as expressed by the Sterling Criteria for Performance Excellence.

This evaluation report is organized in three parts. Part I (page 3) is centered on FLATE's operational goals with a section that includes other elements of performance in key areas. Part II (page 6) includes effectiveness results measures relating, in four sections, to the four overall organizational effectiveness strategies: Sustainability, Curriculum Development and Reform, Outreach and Recruitment, and Professional Development, which speak directly to NSF's expectations for FLATE. Part III (page 29) includes recommendations for improvement based on this evaluation.

Key strengths, opportunities for improvement, and recommendations are summarized here:

Strengths:

- In each area, Sustainability, Curriculum Development and Reform, Outreach and Recruitment, and Professional Development, evaluation evidence shows that FLATE continues to make good progress in addressing and implementing its strategies. FLATE is making headway with its novel sustainability plan. The plan essentially has identified the key FLATE functions and mission elements along with partners and potential partner which will assume responsibility and support for that function to ensure it endures. FLATE's National Visiting Committee has praised the FLATE sustainability approach and plan.

  The use of FLATE-developed curriculum at community and state colleges continues to expand. ET AS degree program enrollment and completions continue to grow, even in the face of overall shrinking growth in enrollments at community colleges nationwide and in related technical programs in Florida. FLATE has excelled in outreach activities with industry and the educational community statewide. Of particular note is FLATE facilitation of MFG Day activities around Florida and support of schools, manufacturer associations and their members. Florida has been recognized again this year as the number one state for the most activity on MFG Day nationwide. Growth in professional development activities and hours has engaged educators and others to support and endorse manufacturing careers.

- FLATE leadership has a clear vision for the future of the FLATE mission and has made strong progress in systematizing its activities in order they can be absorbed by partner organizations and continued beyond the life of FLATE and its grant. The Leadership Team continues to identify, build, and strengthen partnerships in academia and industry.

Opportunities for Improvement and Recommendations:

- Reinforce current FLATE practices and develop new approaches that address and resolve weak recruitment of female students into the ET degree programs within the Florida State College System.

- Continue to refine approaches to the distributed sustainability model deployment to eliminate the expected gap in FLATE's mission beyond the life of the FLATE organization. Build new partnerships as necessary for assumption of key mission elements and functions.

I. FLATE Operational Goals

FLATE Goals as supported by their related Objectives and Effectiveness Measures are the foundation of FLATE strategies for operational performance success. Tables 1, 2, 3 and 4 match sustainability, curriculum development and reform, outreach, recruiting, and professional development goals to their corresponding effectiveness measures. The current Effectiveness Measures and their links to FLATE Specific Goals and Target Objectives for 2012 through 2015 can be found at: http://fl-ate.org/wp-content/uploads/2015/01/2012-15-FLATE-Effectiveness-Measures-Matrix111912.pdf

For additional details and descriptions, please refer to the following links for:

- Strategic Hierarchy: http://fl-ate.org/wp-content/uploads/2015/01/FL-ATE-2012-2015-Strategic-Hierarchy-11-16-pc.pdf

- Objectives &Timelines: http://fl-ate.org/wp-content/uploads/2015/01/Goals-and-Objectives-TimelineV1-110812.pdf

Goal: Effectiveness of Sustainability Efforts. "To ensure that FLATE's mission is sustained."
- There are 10 target objectives with seven corresponding effectiveness measures (Table 1).

Table 1. Effectiveness of Sustainability Efforts

	Measure/Indicator		Measure/Indicator
SE-1	Hillsborough Community College-Brandon organizational chart with shared positions	SE-5	Publish transportable models addressing NSF-ATE needs relationships
SE-2	Sterling Evaluation score trend chart	SE-6	Keep record and copy of submitted documents
SE-3	Stakeholder Survey trend chart scores	SE-7	Number of people and projects supported
SE-4	Receive Florida Sterling Challenge recognition		

Goal: Effectiveness of Curriculum Development and Reform Efforts. "To implement a statewide unified education system for manufacturing that positions manufacturing education as a convergent curriculum that optimizes technician preparation in manufacturing and its enabling technologies."

- There are 11 target objectives with 14 effectiveness measures (Table 2).

Table 2. Effectiveness of Curriculum Development & Reform Efforts

	Measure		Measure
CE-1	Number of adopting institutions from South Florida	CE-8	ET Student enrollment and completion report
CE-2	Number of Department of Defense (DOD) articulations adopted by Engineering Technology (ET) partner schools	CE-9	Number of curriculum modules adapted from ET core for pre-engineering
CE-3	Number of technician certifications earned	CE-10	Populate curriculum repository with ET core curriculum and include interface to ATE Central
CE-4	Aligned ET degree skills to additional stackable credentials	CE-11	Identified common cross cluster technical skills
CE-5	Aligned ET degree skills to Manufacturing Skills Standards Council (MSSC) standards	CE-12	Number of users of integrated ET content
CE-6	Aligned ET degree skills to international endorsed credential	CE-13	Number of ET related high schools and Post-Secondary Adult Vocational School (PSAV) programs
CE-7	Aligned skills to another state's same major manufacturer	CE-14	Number of ET degree colleges

Goal: Effectiveness of Outreach and Recruitment Efforts. "To provide an effective outreach platform for Florida's high school, community college, industry, and legislature to access information related to the requirements for, and impact of manufacturing education."

- There are five target objectives with six corresponding effectiveness measures (Table 3).

Table 3. Effectiveness of Outreach & Recruitment Efforts			
Measure		**Measure**	
OE-1	Number of students impacted by Made-In-Florida	OE-4	Number of Manufacturers Associations implementing regional manufacturing activities
OE-2	Published STEM education best practices	OE-5	Report on FLATE's Graduate Connection Program
OE-3	Number of outreach events and partnerships	OE-6	Number of website hits

Goal: Effectiveness of Professional Development Efforts. "To present professional development opportunities for technical faculty to develop, refine, or certify their knowledge base within manufacturing and/or its related enabling technologies and educational pedagogies."

- There are five target objectives with five effectiveness measures (Table 4).

Table 4. Effectiveness of Professional Development Efforts			
Measure		**Measure**	
PDE-1	The number of teachers supported	PDE-4	Published Professional Development best practice
PDE-2	Professional development hours trend	PDE-5	List of professional development events
PDE-3	Number of statewide Forum models implemented		

II. Operational Performance Results

Section A. Effectiveness of Sustainability Efforts

Refer to Table 1 on page 4.

Results of Effectiveness Measures SE-1 and SE-6 (i.e. creating an organizational chart and keeping records of submitted documents) will not be reported here as they are administrative indicators and this report is focused on measures of effective performance.

Table A-1, below, addresses Effectiveness Measure SE-2.   With regard to the Florida Sterling

	Category	Available Points	2008	2010	2012	2014
Table A-1 FLATE Sterling Evaluation Score Trend						
1	Leadership	140	42	56	63	84
2	Strategic Planning	100	40	50	45	55
3	Customer Focus	100	40	40	50	55
4	Measurement, Analysis, & Knowledge Management	100	25	30	40	45
5	Workforce Focus	100	30	30	30	45
6	Operations Focus	100	30	30	40	55
7	Results	360	126	126	144	162
	Total	1000	333	362	412	501

bi-annual self-assessment, the table shows a continued favorable trend at high levels. The data show a favorable increase in overall scores in each successive bi-annual survey since 2008, the first time the Sterling evaluation had been conducted. The next assessment based on the Sterling Criteria model will be conducted in 2016.

Regarding related Effectiveness Measure SE-4: the official Florida Sterling Challenge recognition has not yet been attempted.

Effectiveness Measure SE-3 is addressed by the biannual Stakeholder Survey, Tables A-2 and A-3, conducted in odd numbered years. In 2015, over 2400 valid survey response requests were

emailed to FLATE stakeholders. One hundred ninety-four responses were received, a response rate of about 8%, which is down from the last survey. Of the responses received, about 68% are K-12 and Post-Educators/Administrators, with the remainder Business/Industry representatives, Workforce and Economic Development Professionals, those representing Florida Department of Education and Government, and Educational Suppliers and Vendors. About 61% of total respondents are located in the State of Florida. This survey was modified this year to gain more resolution of responses from educators to distinguish from all others.

Table A-2 For Educators/Administrators (2015 responses)

Survey Statement	% Strongly Agree			% Agree			% Disagree			% Strongly Disagree			% Not Applicable			%Not Tried		% Not Familiar		
	These percentages below are of the total respondents who answered the question																			
	2011	2013	2015	2011	2013	2015	2011	2013	2015	2011	2013	2015	2011	2013	2015	2011	2013	2015		
I have easy access to FLATE's staff and its products.	41	35	43	50	45	42	1	6	1	0	1	0	8	13	15	N/A	N/A	N/A		
FLATE staff have helped me whenever I requested it.	30	37	52	36	27	22	1	2	2	3	0	0	22	25	24	8	10	N/A		
FLATE's "Made in Florida" outreach materials and/or activities have assisted me.	19	21	32	38	30	41	3	5	0	1	1	0	30	25	22	10	18	5		
Professional development initiatives provided by FLATE have assisted me in my work.	29	25	35	30	32	31	5	3	0	0	0	1	30	28	N/A	7	13	N/A		
Curriculum initiatives provided by FLATE have assisted me.	24	21	34	33	28	37	4	3	4	0	0	2	29	30	N/A	10	17	24		
Curriculum materials provided by FLATE have assisted me.	24	20	31	40	31	36	5	4	3	0	0	1	21	30	N/A	9	15	30		

Table A-3 For Others (not Educators/Administrators) (2015 responses)

Survey Statement	% Strongly Agree			% Agree			% Disagree			% Strongly Disagree			% Not Applicable			%Not Tried		% Not Familiar		
	These percentages below are of the total respondents who answered the question																			
	2011	2013	2015	2011	2013	2015	2011	2013	2015	2011	2013	2015	2011	2013	2015	2011	2013	2015		
I have easy access to FLATE's staff and its products.	41	35	58	50	45	36	1	6	2	0	1	0	8	13	5	N/A	N/A	N/A		
FLATE staff have helped me whenever I requested it.	30	37	55	36	27	33	1	2	0	3	0	0	22	25	12	8	10	N/A		
FLATE's "Made in Florida" outreach materials and/or activities have assisted me.	19	21	27	38	30	41	3	5	5	1	1	0	30	25	26	10	18	2		

This year the "Not Applicable" response possibility was augmented or eliminated for some questions to provide a more highly resolved response which provides more actionable information. For instance, this year "Not Attempted" is a possible response to the questions about access, to force a response to some level of agree or disagree; a "Not Applicable" response does not provide clarity about the true meaning of "Not Applicable".

- Curriculum and professional development questions were not asked of non-educators and administrators.

- Comments were submitted by more than half of all respondents in three areas.

  o What is FLATE's most important contribution to you? (112 comments entered)
    - There were a wide range of favorable comments, about 50% relating to Outreach & about 25% each in Curriculum & Professional Development

  o What can FLATE change to improve its initiatives, activities, and/or products to better serve you? (79 comments entered)

    - About 50% of the commenters said "nothing" or that FLATE should do more of what it already does well.
    - More geographic diversity in outreach
    - More school tours and targeted tours
    - More formal sharing processes/better website navigation to locate material

  o What new initiatives, activities, and/or products could FLATE develop that you would be interested in? (63 comments entered)

    - About 25% of the commenters said "nothing"
    - Regarding Outreach: More engagement of middle and elementary school students and parents
    - Regarding Curriculum: More 3D printing related activity

- Regarding Professional Development: Best practice identification and sharing with teachers

Addressing Effectiveness Measure SE-5, FLATE has published eight Best Practice Guides recommended by stakeholders to fulfill part of its NSF mission by sharing organizational learning and expertise through dissemination. To this end, since 2010 FLATE has developed and distributed both electronically and in hard copy, a "FLATE Best Practice Guide" series beginning with publication of *Robotics Camp Survival Guides.* The series has expanded with additional publications including *Forging Positive Partnerships in Florida, Project Highlights, Statewide Curriculum & Degree Program Review Processes, Industry Tours for Students, FLATE Communication program,* and in 2014, *Recruiting & Retaining Girls in STEM*, and *Professional Development.* The series responds to inquiries from various ATE centers and other organizations about areas of structure and outreach related to the topics of the guides. The series of booklets is a compilation of best practices derived from experience with organizational comparisons, focus groups and stakeholder feedback.

The following applies in relation to addressing Effectiveness Measure SE-7. FLATE mentored a number of institutions in 2015 in various ways. Table A-4 indicates the breakdown of these numbers of organizations according to the type of mentoring provided.

Table A-4 People and Projects Supported		
	2014	**2015**
ATE Grant Proposals - Awarded	9	10
ATE Grant Proposals - Developed/Started	26	22
AS Curriculum - Mentoring	27	25
Outreach - Mentoring	21	24
ET Degree Mentoring - In Florida	12	30
High School/PSAV Mentoring - In Florida	10	21

Expressed interest continues from around the Nation to learn more about the FLATE originated ET program and how its supporting curriculum operates. The following list of nationwide-

projects inquiry contacts provides a sample of some of these inquiries and the positive impact of FLATE mentoring activities in 2015.

- College of the Canyons (Santa Clarita, CA) – Communicated by email and telephone; representatives visited FLATE to explore how the ET Core was set up and aligned with the MSSC CPT, as well as implementation of the specialization tracks.
- Peterson Academy (Jacksonville, FL) - Mentored administrators and teachers in setting up summer robotics camps.
- San Jacinto College (Pasadena, TX) – Representatives planning a new facility, visited FLATE to learn about the ET Degree program and how it supports manufacturers.
- Mentored several Florida state and community colleges (i.e. Daytona, Florida Keys, Pasco-Hernando, Palm Beach, Northwest Florida, Valencia, Indian River, and Lake Sumter in support of adopting and implementing new ET A.S. Degree Programs.
- Piedmont Valley Community College (Charlottesville, VA) - Mentored for Advanced Manufacturing ATE grant development.
- North Carolina Department of Education – Mentored for MSSC CPT implementation in high schools statewide.

Section B. Effectiveness of Curriculum Development Efforts

Refer to Table 2 on page 4.

This Table B-1, below, displays a very favorable trend in Florida College adoptions and implementations of the FLATE-developed Engineering Technology (ET) AS degree program. The table names each of the adoptive colleges. Eighteen of the state's 25 colleges with manufacturing-related programs have adopted and implemented the ET AS degree program. This table addresses Effectiveness Measures CE-1 and CE-14. In 2015, four schools newly implemented the ET AS degree program. There are 11 approved specializations associated with the ET degree, at least one at every adoptive college, and 18 technical college certificates. The

most recent specialization, added in the 2014-2015 academic year, is the Relay Substation specialization at Lake Sumter State College.

Table B-1 Academic Year – ET Degree Program Adoptions	
Academic Year	**Number of Colleges**
2007-2008	3
2008-2009	5
2009-2010	10
2010-2011	11
2011-2012	13
2012-2013	13
2013-2014	14
2014-2015	19
19 Florida Colleges Implementing ET Program as of 2014	
Eastern Florida State College (Cocoa)	St. Petersburg College (Clearwater)
College of Central Florida (Ocala)	Polk State College (Lakeland)
Hillsborough Community College (Tampa)	Florida Gateway College (Lake City)
Florida State College at Jacksonville	Pensacola State College
State College of Florida (Venice)	Tallahassee Community College
Northwest Florida State College (Niceville)	Broward College (Coconut Creek)
Gulf Coast State College (Panama City)	Seminole State College (Sanford)
Pasco Hernando State College (Port Richey)	Palm Beach State College
Chipola State College (Marianna)	Lake Sumter State College (Leesburg)
Note: Daytona State College, without an ET AS Degree Program, has established a ET BS degree program incorporating FLATE ET frameworks	

There are no data addressing Effectiveness Measure CE-2 this reporting period, relating to the number of DOD articulations adopted by ET partner schools.

Figure B-2 addresses Effectiveness Measure CE-3, regarding the number of technician certifications earned. An advantage for students in the ET AS degree program is the program's

Figure B-2 Number of MSSC CPT Certifications Earned in Florida
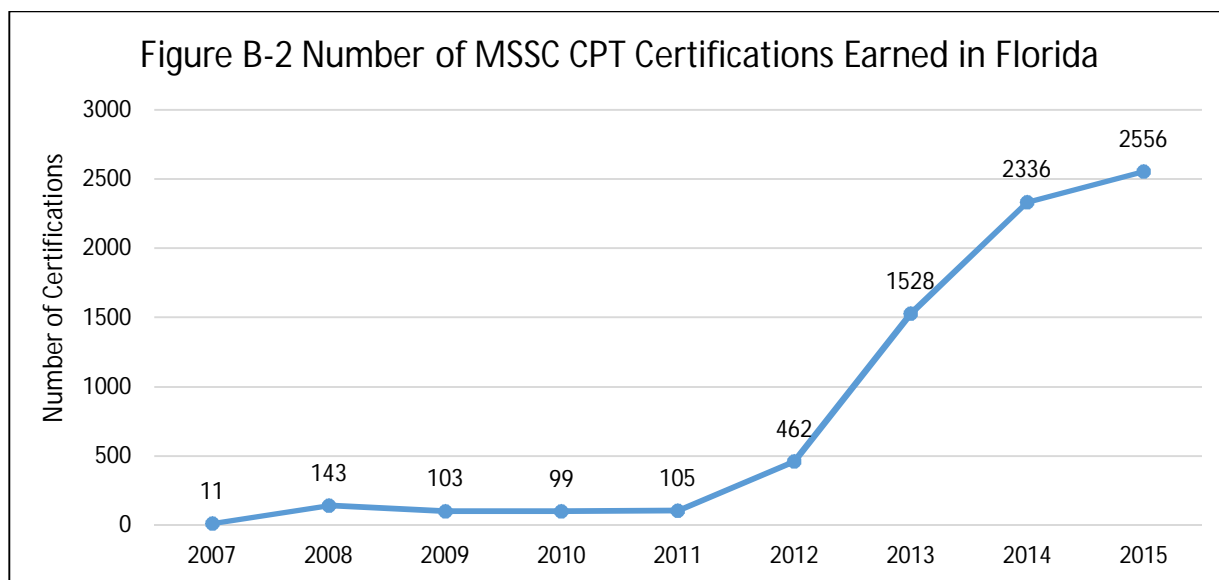
Manufacturers Skills Standard Council (MSSC) alignment. A student coming in to the program with the MSSC Production Technician certification (CPT) has the advantage of being offered by the college, 15-college credit hours for the certification. Students entering without the certification will have completed the course of study in preparation to sit for the certification examination. As described by the data in Figure B-2, the number of certifications in the State of Florida show a favorable and strong positive trend. In the latter years, this is not entirely a direct result of current FLATE and ET enrollment activity, but can be traced to FLATE's original concept for integrating the MSSC CPT into the ET AS degree program curriculum and implementing in 2007.

This addresses effectiveness measure CE-4 this reporting period. Over the past 18 months, FLATE has been working with the post-secondary and high schools machining programs, machining professionals and the Florida Department of Education (FDOE) to re-write, revise and update the frameworks for machining, now called Machining Technologies. These two documents can be accessed on the FDOE website for Manufacturing Curriculum Frameworks. The new post-secondary program is "Machining Technologies (J200100)" and new high school program is "Machining Technologies (9202100)". Both are available for implementation in the 2015-2016 academic year.

The Florida Curriculum Frameworks are rich documents that define all aspects of career and technical education in Florida. In addition to the workforce skills and knowledge in defined occupations, the High School curriculum frameworks include alignment to academics (literacy, mathematics, science) and the new Florida standards. These standards enrich the skills-based training the students get with applied foundational knowledge of principles and processes used in the technologies providing a strong base for career advancement and life-long learning. The improved alignment between secondary and post-secondary programs comes from re-defining the post-secondary programs to be the same length as the high school programs. A typical high school course is 150 contact hours during a year. To align with high school programs, the post-secondary adult vocation frameworks should be of the same length or be of an integer multiple of 150. The entire program is divided into multiple courses to provide opportunities for students to take a one or more courses, go to work, and come back to complete more advanced courses. It is important to note that the educational frameworks should include all of the industry skills and knowledge standards. However, Florida frameworks must also include reading, writing, literacy and mathematics standards at all levels and in all programs including career and technical education programs (CTE). All CTE programs must also include Common Career Technical Core - Career Ready Practices, common to all career pathways.

These secondary and post-secondary frameworks have now been cross-walked by the FLATE team to the NIMS Machining Level l standards. The alignment to the NIMS will make it easy to move forward with a strongly aligned secondary/post-secondary to community college program articulation using the NIMS credential. The statewide articulation used with the stackable credentials provide desirable accelerated degree pathways.

Effectiveness Measure CE-5 and CE-6, ET degree skills aligned to credential, were addressed in last year's report. Last year's discussion is still applicable. No new data have been collected.

There is no progress for Effectiveness Measure CE-7. The partner manufacturer with facilities across states has been acquired and integrated into another company. Therefore, the partnership no longer exists to facilitate academic alignment of a stackable credential outside of Florida.

Figures B-4 and B-5, addressing Effectiveness Measure CE-8, display enrollment and completion data, respectively, for the ET AS degree program. Both of these figures immediately indicate continued favorable trends and growing enrollments for the ET degree program.

Figure B-4 AS Degree Enrollments

Year	Related AS Programs	ET Program
2009-2010	4224	347
2010-2011	5168	603
2011-2012	4622	703
2012-2013	4195	1109
2013-2014	3244	1525
2014-2015	2963	1686

(Y-axis: Enrollees)

Figure B-5 AS Degree Completions

Year	Related AS Programs	ET Program
2009-2010	524	14
2010-2011	601	37
2011-2012	499	32
2012-2013	531	83
2013-2014	422	80
2014-2015	346	110

(Y-axis: Axis Title)

Especially noteworthy are the comparative enrollment data for related technology programs in Florida as shown in Figures B-4 and B-5. These programs include Aerospace Technology; Biomedical Engineering Technology; Chemical Technology; Computer Integrated Manufacturing; Drafting & Design Technology; Electrical Distribution Technology; Electrical Power Technology; Electronics Engineering Technology; Industrial Management Technology; Manufacturing Technology; Simulation and Robotics Technology; and Supply Chain Management. The number of students enrolled in the ET degree program over the recorded period increased by over 1,000 students. By comparison, the number of students in all the rest of the AS manufacturing related programs decreased by more than 1000 students. Figures B-6, and B-7 show comparison enrollments in percentage growth in enrollments and completions. Figure B-6 shows every year since 2010-11, between the ET AS degree program and other related technology AS degree programs in Florida. As can be seen by these data, in Figure B-6, the percent annual growth in enrollments in the ET AS degree program in consistently higher growth than other related technology AS degree programs, which primarily shows negative growth.

Figure B-6 Program Enrollment Growth Comparison

	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
Related AS Programs	22.3%	-10.6%	-9.2%	-22.7%	-8.7%
ET Program	73.8%	16.6%	57.8%	37.5%	10.6%
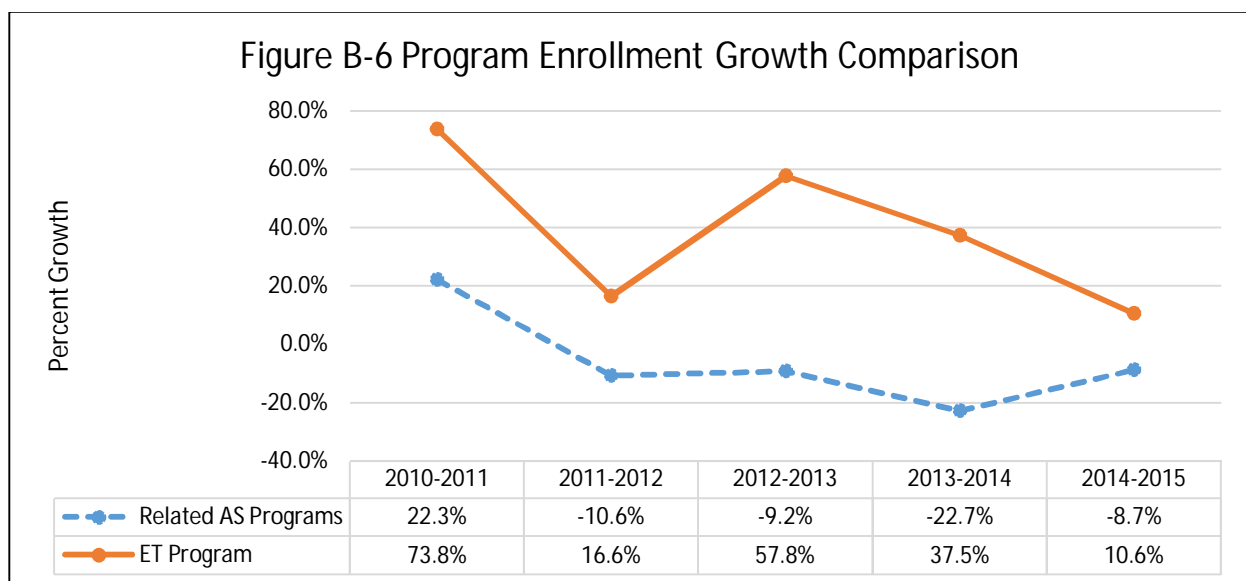
Figure B-7 shows data comparison of completions growth between the ET AS degree program and related programs. While ET program completions are at more favorable levels than related programs in each year depicted and each year growth is higher than related AS program completion growth, the trend is more variable than enrollment growth.

Figure B-7 Program Completions Growth Comparison

	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
Related AS Programs	14.7%	-17.0%	6.4%	-20.5%	-18.0%
ET Program	164.3%	-13.5%	159.4%	-3.6%	37.5%
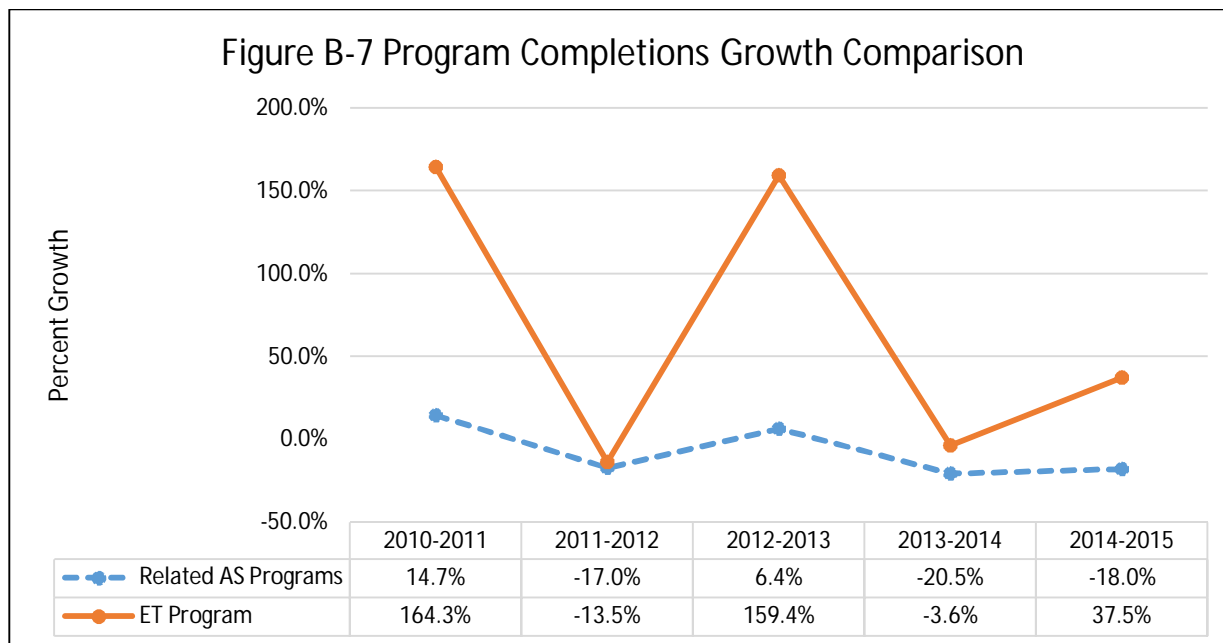
The following four figures provide data on another aspect of ET AS degree program enrollment and completions; i.e. diversity of the program enrollees and completers, namely females and minorities. In Figures B-8 and B-9 these data indicate favorable trends in growth of the minority enrollee and completer populations in the ET AS degree program. These trends match favorably, although slightly lower than the comparable data for Related AS Programs.

Figure B-8 Percentage Minority Enrollment

	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
Related AS Programs	40.0%	45.0%	45.0%	50.0%	52.0%
ET Program	34.0%	37.0%	41.0%	55.0%	47.0%

Figure B-9 Percentage Minority Completions

	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
Related AS Programs	35.0%	39.0%	30.0%	39.0%	51.0%
ET Program	30.0%	31.0%	33.0%	34.0%	36.0%
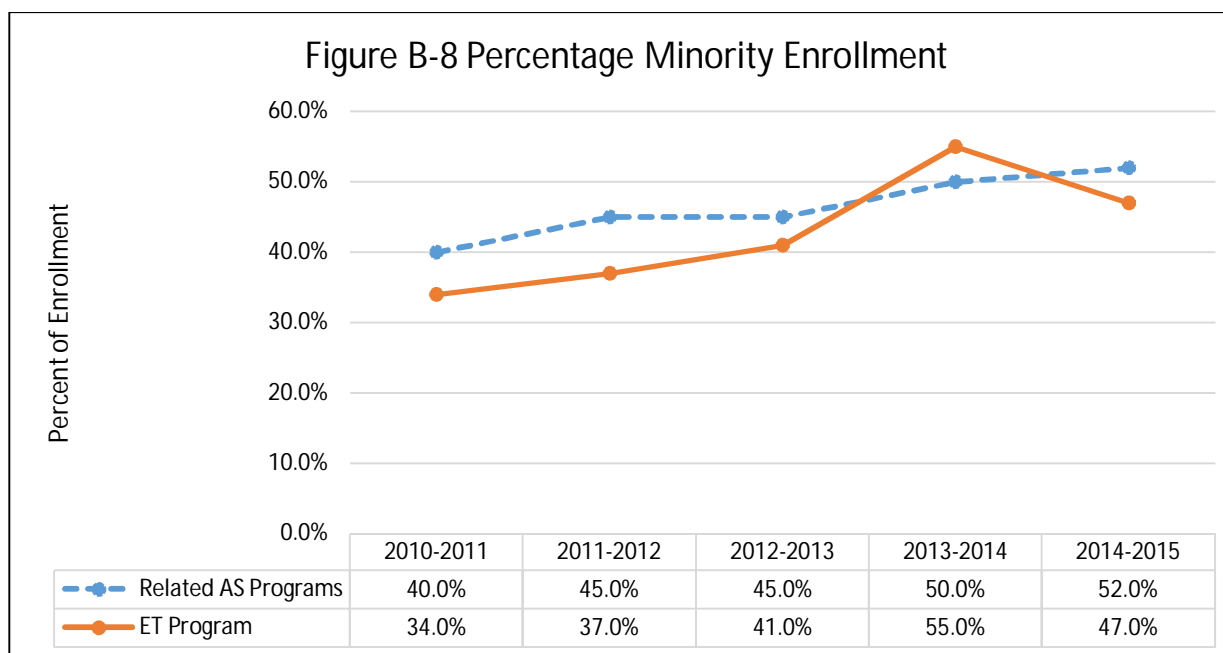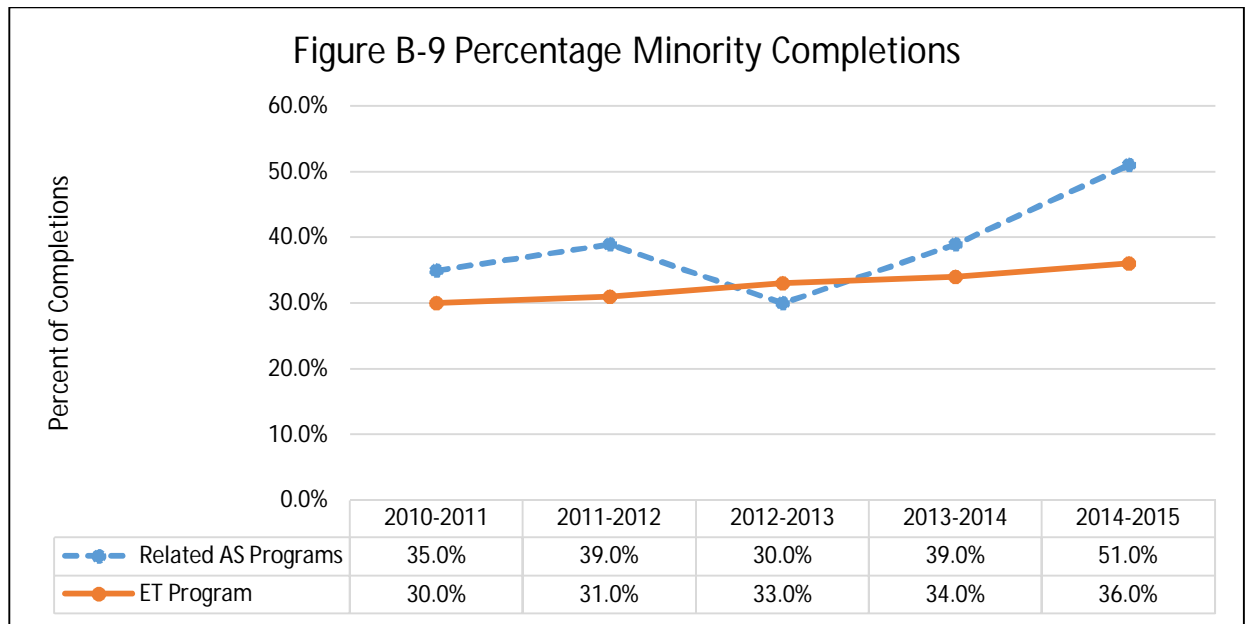
The analogous levels and trends for female enrollees and completers are unfavorable. As seen in Figures B-10 and B-11 it is shown that female enrollments and completions for Related AS Programs are higher than the ET Program in most years. Focus on female enrollment and completion continues to be an opportunity area for FLATE. FLATE continues efforts in this area, including continuing the All-Girls Robotics Camps, girl camp scholarships, a webinar (recorded) about recruiting girls, and a wiki page with resources for female recruitment. continued in 2015.

Figure B-10 Percentage Female Enrollment

	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
Related AS Programs	24.0%	22.0%	19.0%	16.0%	20.0%
ET Program	15.0%	11.0%	9.0%	10.0%	10.0%

Figure B-11 Percentage Female Completions

	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
Related AS Programs	19.0%	18.0%	19.0%	17.0%	16.0%
ET Program	16.0%	12.0%	12.0%	17.0%	7.0%

Y-axis: Percent of Completions
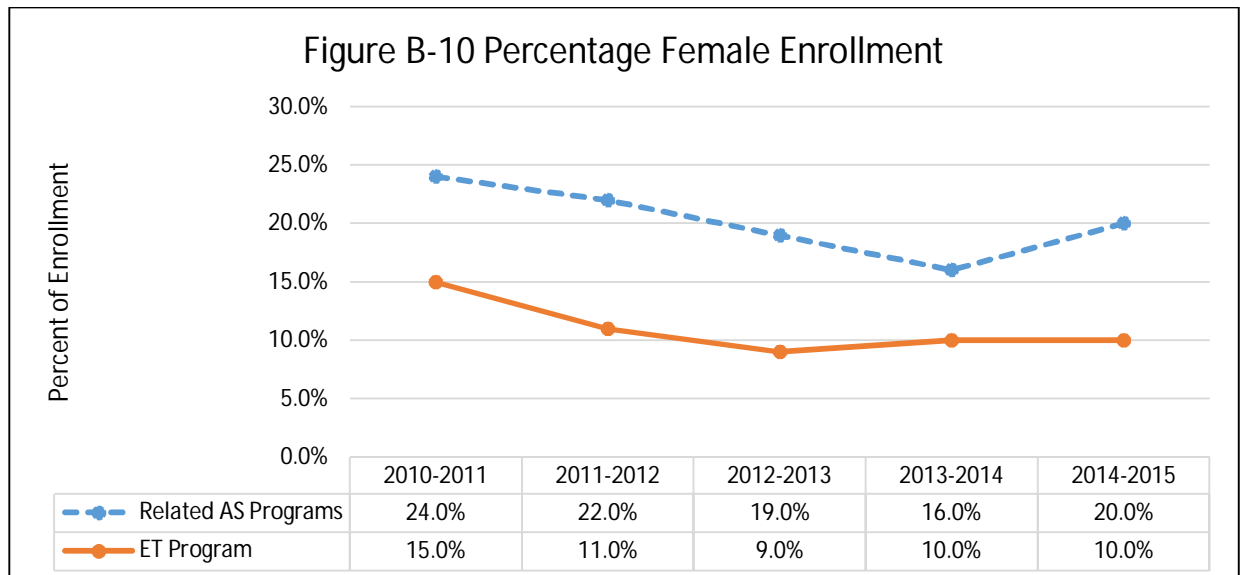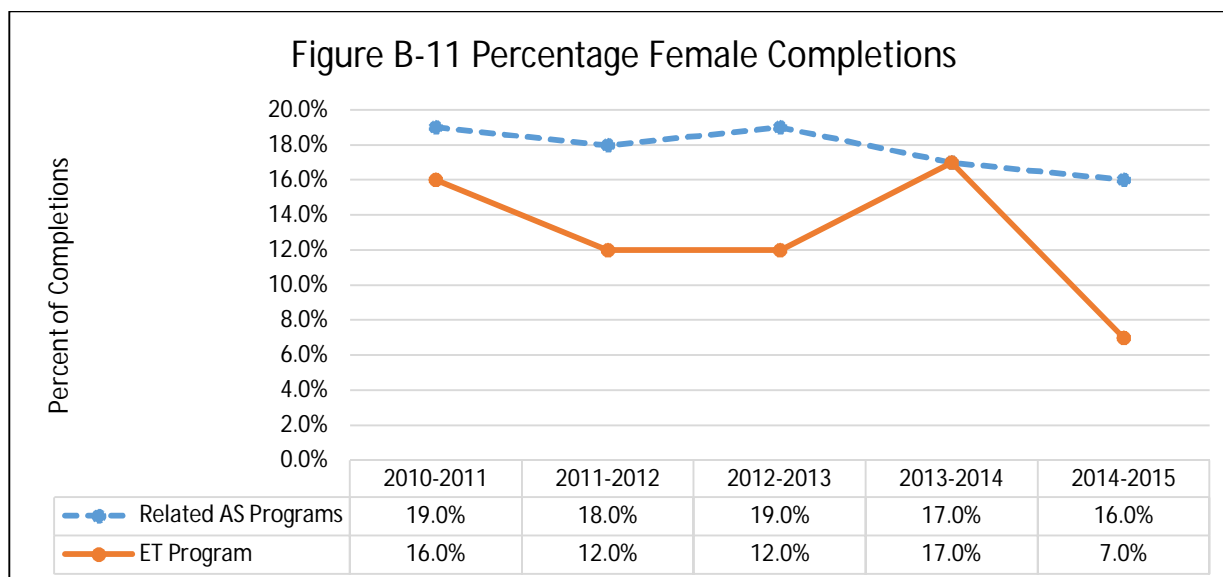
This addresses Effectiveness Measure CE-9 reported this period. FLATE coordinated and mentored the integration of the MSSC CPT into the pre-engineering course of instruction at Middleton High School in Hillsborough County. This was a result of a Project Lead the Way initiative.

Effectiveness Measure CE-10 is addressed by the following information. FLATE reviewed its resources on its wiki site to determine which should be archived on ATE Central and worked with ATE Central to get them in appropriate formatting for the repository. ATE Central has been designated the NSF ATE archive site for all NSF ATE resources, providing indefinite access to these resources. FLATE archived items on ATE Central will be reviewed annually to update the archived versions of any materials that are updated by FLATE. This new designation of ATE Central as the NSF ATE archive site provides long-term sustainability of FLATE's digital resources.

There are no data addressing Effectiveness Measure CE-11 reported this period, relating to identified common cross-cluster technical skills.

Table B-12 addresses Effectiveness Measure CE-12 by tracking the number of hits on the FLATE wiki page, indicating the number of users of integrated ET content.

Table B-12 FLATE Wiki Hits				
	2014 Online Visits	2015 Online Visits	2014 Page Views	2015 Page Views
High School Resources	117	121	250	217
Middle School Resources	142	93	356	193
Career CTE Resources	93	186	195	308

FLATE's wiki site has evolved and matured in recent years to not only host curriculum resources (per table B-12) but also outreach, professional development, and recruiting resources, as well as curriculum to support the A.S. Engineering Technology, and related industry credentials. Visits on these pages have not been tracked to date.

Figures B-13 and B-14 address Effectiveness Measure CE-13. Figure B-13 data show flat to slightly unfavorable trends in both enrollments and graduations in secondary school technology programs. Nine High Schools have integrated MSSC CPT into their technology programs. High school technology programs constitute one of the pathways into the ET AS degree program.

Figure B-13 High School Enrollments and Graduations - Technology Programs

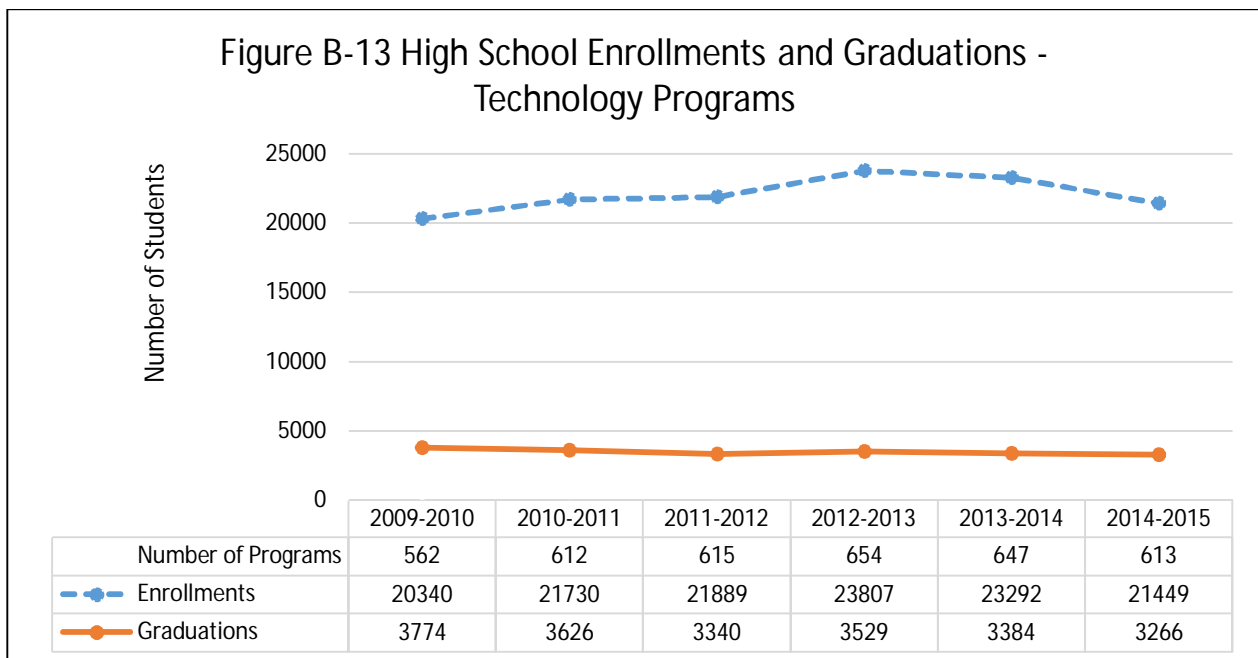|	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
Number of Programs	562	612	615	654	647	613
Enrollments	20340	21730	21889	23807	23292	21449
Graduations	3774	3626	3340	3529	3384	3266

Figure B-14 describes performance of another pathway into the ET AS degree program, Post-Secondary Adult Vocational (PSAV) technical programs. This pathway is apparently performing slightly better than the high school pathway. Four PSAV level institutions have integrated the MSSC CPT into their programs. These institutions are Withlacoochee Technical Institute, Citrus County; Pinellas Technical College, Pinellas County; Ridge Career Center, Polk County; and North Florida Community College, Madison County.

Figure B-14 PSAV Enrollments and Completions

	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
Number of Institutions	30	37	35	33	35
Number of Programs	9	7	6	8	5
Enrollments	1557	1559	1475	1639	1773
Graduations	522	525	525	596	457
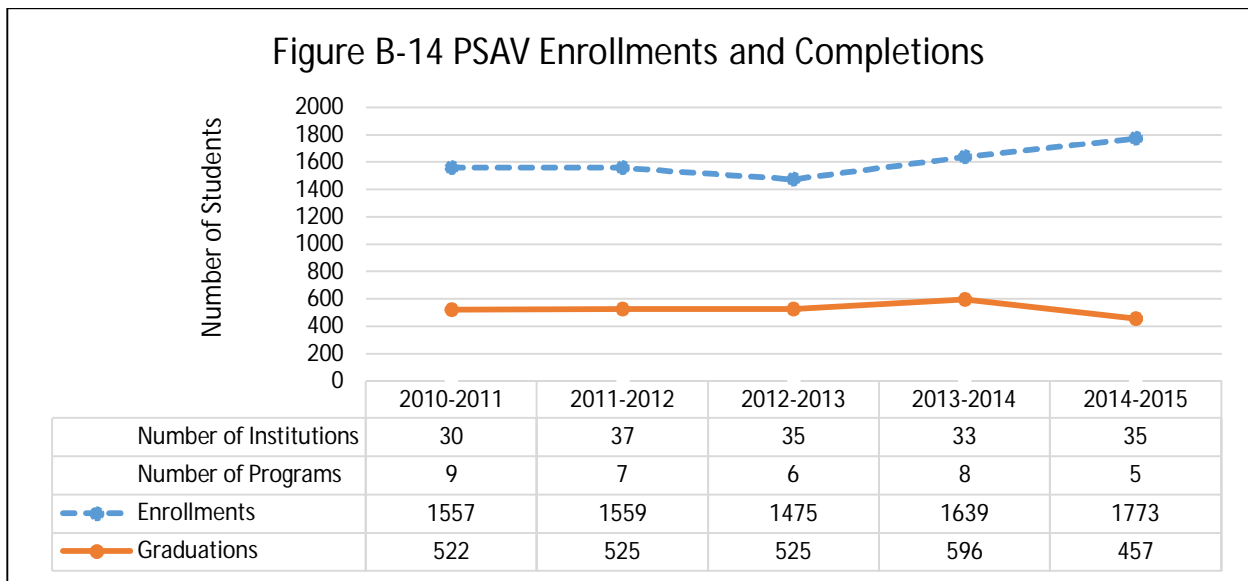
Effectiveness measure CE-14 is addressed coincident with Effectiveness Measure CE-1, the number of adopting institutions in South Florida.

Section C. Effectiveness of Outreach and Recruitment Efforts

Refer to Table 3 on page 5.

Please refer to page 9 above and the description of information addressing Effectiveness Measure SE-5. That information also applies and addresses Effectiveness Measure OE-2, relating to published STEM education best practices.

Effectiveness Measures OE-1, OE-3, and OE-4 are addressed by the following data and information. Since 2005, FLATE has facilitated close to 400 tours to 234 high-tech, manufacturing facilities throughout Florida for over 10,000 students, and almost 1,000 educators and parents. One of FLATE's goals has been to provide students with exposure to real Science, Technology, Engineering and Math (STEM) workplaces, primarily those in manufacturing. Students are surveyed after the tours to gather data to discover what the students experienced from their own point of view and to help streamline and improve tours in the future.

FLATE coordinated statewide events on Manufacturing Day/Month for the third time in 2015, working with partners and collaborators around the state. These included a number of manufacturers associations, colleges, workforce development organizations and the Florida TRADE TAACCCT grant consortium. Of the 14 Regional Manufacturer Associations, nine in 2014 and 11 in 2015 implemented MFG Day and related activities for outreach to the community. Data (see Table C-1) from 2015 Florida MFG Day tours to advanced manufacturing facilities are favorable and exceed the 2013 and 2014 numbers. In 2015 about 4770 students statewide toured 130 manufacturer facilities across Florida.

FLATE has developed and implemented processes for organizing and deploying effective student tours of manufacturing facilities and determining the impact they have on students and educators. Data collected includes anecdotal evidence based on feedback from students, industry hosts, staff, and teachers as well as aggregated survey results from eight years of student tours of manufacturing facilities. Surveys were completed by over 2000 students in 2015. About 36% of the students answered "No" to the question: I was considering a career in advanced manufacturing before the tour. Following the tour, nearly 60% responded "Yes" to the question: I am now considering a career in advanced manufacturing. Participation in industry tours helps to dispel misconceptions about today's manufacturing industry, and potentially influences student education and career choices.

Table C-1 Key MFG Day Activities Trends					
	# Tours	# Manufacturers	# Teachers	# Parents	# Students
2013	68	72	110	71	2331
2014	95	88	174	113	3150
2015	159	130	318	318	4770

Partner engagement included participation in Made-In-Florida tours, MFG Day tours and activities, and sponsorships and other cash and in-kind donations, hosting FLATE meetings and events, and general outreach. Figure C-2 depicts the levels and trends in partner contributions, both cash and in-kind, to FLATE activities. Higher contributions are indicative of greater engagement.

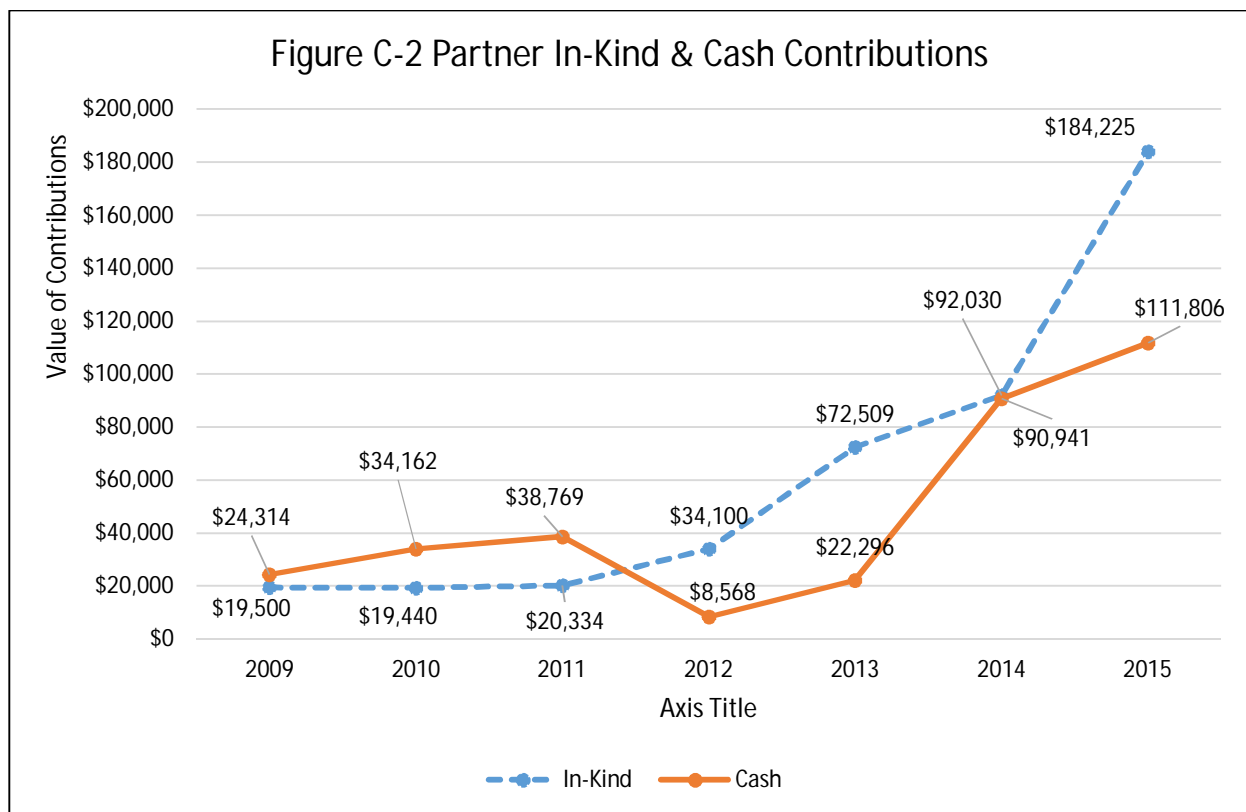Figure C-2 Partner In-Kind & Cash Contributions

Figure C-3 also addresses Effectiveness Measure OE-3 by providing more detail to FLATE's partnership activity and partner engagement. The figure reflects a generally favorable trend in increase the number of attendees at Industry Advisory Committee (IAC) meetings

Figure C-3 Industry Advisory Committee (IAC) Attendance
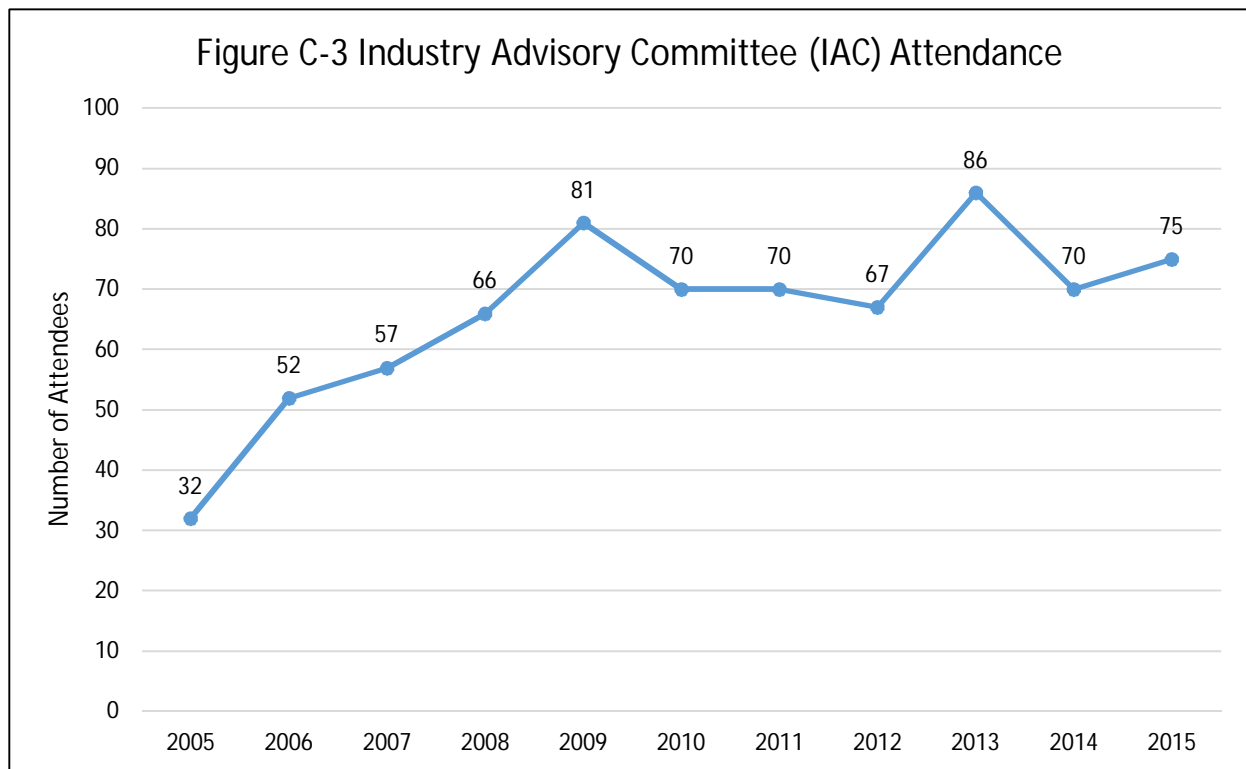
Addressing Effectiveness Measure OE-5: In an effort to establish a connection with ET AS degree graduates in Florida, follow and/or track their career and educational pathways once they graduate from one of the 18 colleges offering the degree, FLATE has established the LinkedIn® connected Graduate Connection Program. The effort represents a direct, call-to- action based upon the suggestions/feedback received during the National Visiting Committee meeting in 2014. Working with the Maricopa Advanced Technology Education Center (MATEC), FLATE created a site that interfaces with users' LinkedIn® profiles. FLATE currently maintains a "LinkedIn® profile" and moderates an exclusive LinkedIn® group. The profile works similarly to an individual profile and is mainly a vehicle for FLATE to connect with industry and educational partners. The group is exclusive and is open to ET degree alumni only. The LinkedIn® profile has 101 industry and educator connections; the ET alumni page has 30 members that is comprised primarily of ET students, alumni, and some educators. FLATE also has 102 LinkedIn® alumni profile connections.

This information addresses Effectiveness Measure OE-4. MFG Day is the primary vehicle for FLATE outreach to students, partners, and industry. Tracked since 2014, The number of manufacturers associations implementing regional outreach-related activities grew from 9 of 14 in 2014 to 11 of 13 in 2015.

Figure C-5 Website Performance by Individual Visit Count
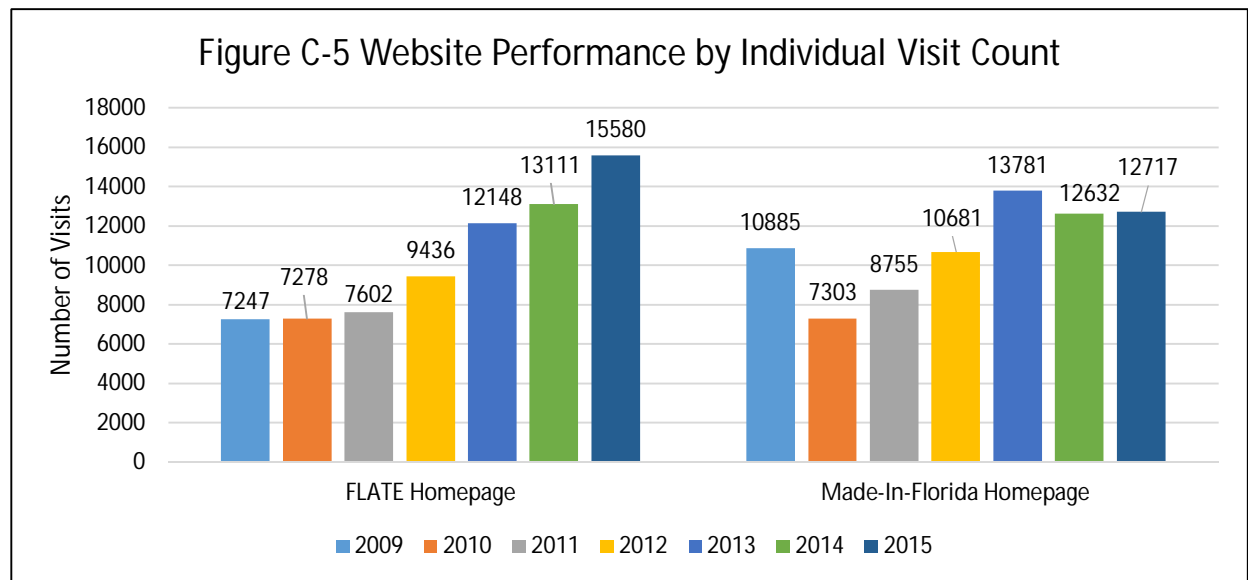
Figures C-5 and C-6 address Effectiveness Measure OE-6. The data in Figure C-5 provide the summary view of the FLATE homepage and the Made-In-Florida home page performance. The data indicate both are trending favorably; FLATE home page visits are growing in visit count each year since 2009; Made-In-Florida visits are more variable but with a generally favorable trend in the same period.

Figure C-6 pertains to the FLATE *FOCUS* newsletter. The total number of visits as well as the total reader distribution has continued to increase. The total number of visits has increased dramatically over the last five years with 7,310 readers expanded to 31783 readers by the end of 2014. This increase is notable because the total distribution, although increasing is not advancing at the same rate. FLATE has experienced a 21.1% visit to distribution "Open Rate" ratio in each 2012 and 2013, and 23.4% in 2014. The favorable FLATE trends suggest that more recipients return to the newsletter and/or are passing it on to new readers not within the current distribution base.

Figure C-7 Newsletter Total Distribution and Visits
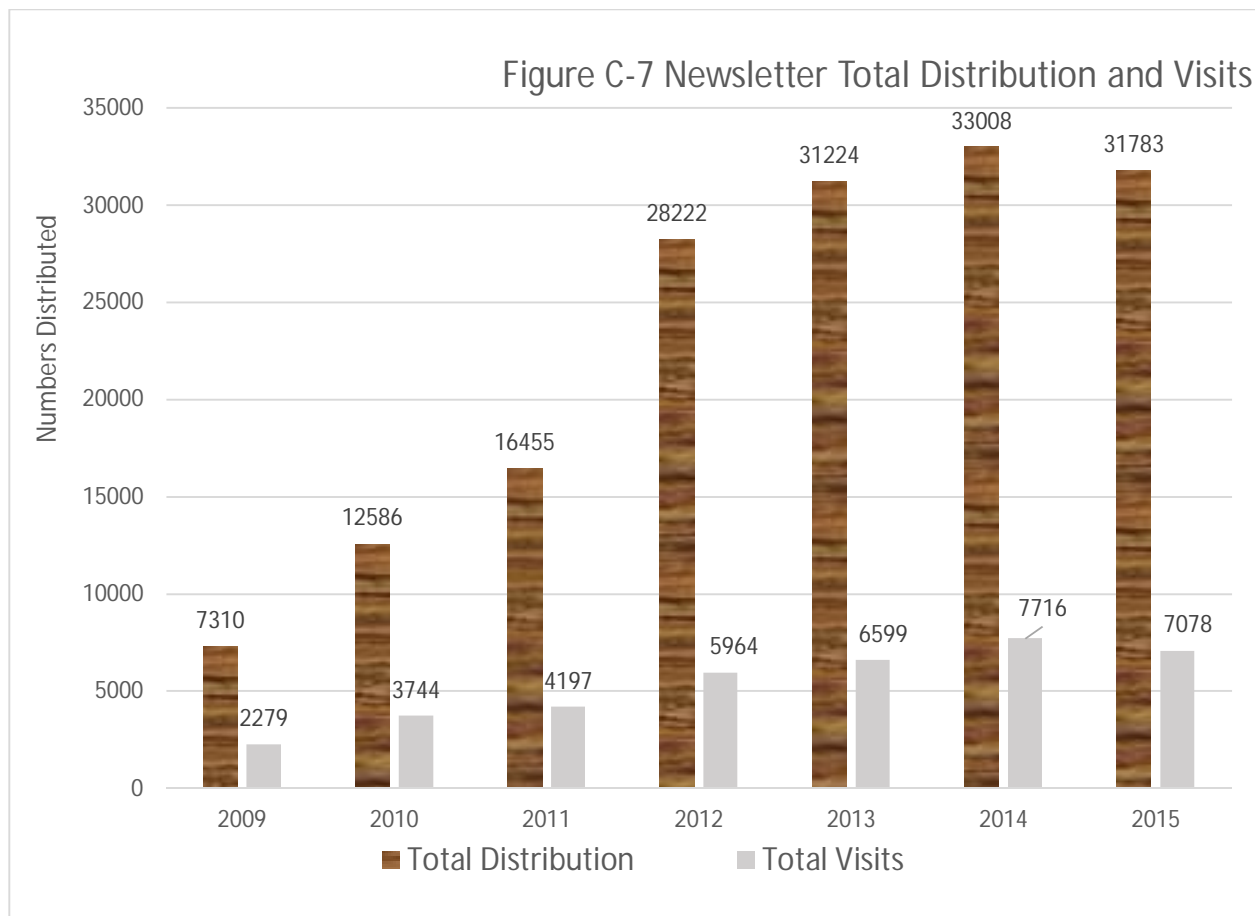
It is generally recognized in the marketing field that an "Open Rate" of 20% or higher for an email newsletter/blog, ratio of visits to distribution, is very good. (Sources: http://www.launchbit.com/blog/what-is-a-good-open-rate-for-your-email-newsletter/ and http://mailchimp.com/resources/research/email-marketing-benchmarks/). As can be seen by the data in Figure C-7, FLATE's "Open Rate" is above the 20% mark in 2015.

**Section D. Effectiveness of Professional Development Efforts**

Refer to Table 4 on page 5.

Addressing Effectiveness Measure PDE-1: The curriculum FLATE presents in its workshops reflects the current technical needs of industry, and can be made sustainable by the adoption of

presented ideas into other resources used by STEM and career and technical educators, and passed along to students and other educators. FLATE professional development opportunities are offered throughout the year, with a particular focus over the summer where recurring and variable topic multiple day workshops such as the ET Summer Institute, FLATE Summer Camp for Teachers, and FLATE presentations at the Florida Association for Career and Technical Education (FACTE) conference. FLATE is a frequently requested partner and presenter for teacher professional study days, and provides workshops onsite at its host college, or offsite at local schools. In both 2014 and 2015, the FACTE co-sponsored the ET Summer Institute. In 2015, the ET Summer Institute focused on Advanced Manufacturing Careers with session topics which included session topics of interest to both educators and industry.

Subject matter experts are invited to workshops as panelists, teachers, and to share relevant experience and best practices. FLATE shares its professional development and workshop curriculum and instructional resources for educators through its free, online wiki at www.flate.pbwiki.com. FLATE keeps professional development curriculum and resources current by monitoring trends in education and industry needs, through close association and feedback from a cohort of vendor-partners, through informal and formal focus group sessions at meetings, and by integrating manufacturing topics into STEM education so that more teachers, students, and parents are exposed to advanced manufacturing concepts. FLATE workshops often include an introduction to its unique and award winning industry connected educational resources.

In 2015 FLATE provided 5,329 hours of professional development to 1,135 college educators, 290 high school, 51 middle school, and 50 elementary school teachers as well as 481 workforce, economic development, and manufacturing personnel, and other non-level-specific educators. Professional Development workshops predominately include K-14 educators and staff, such as counselors and administrators, who attend FLATE workshops to learn more about STEM in advanced manufacturing and related subjects. Figure D-1 addresses Effectiveness Measure PDE-2. This figure reflects data indicating a favorable trend and an increase in the number of hours of Professional Development conducted by FLATE over the last 6 years.

Figure D-1 Professional Development Hours
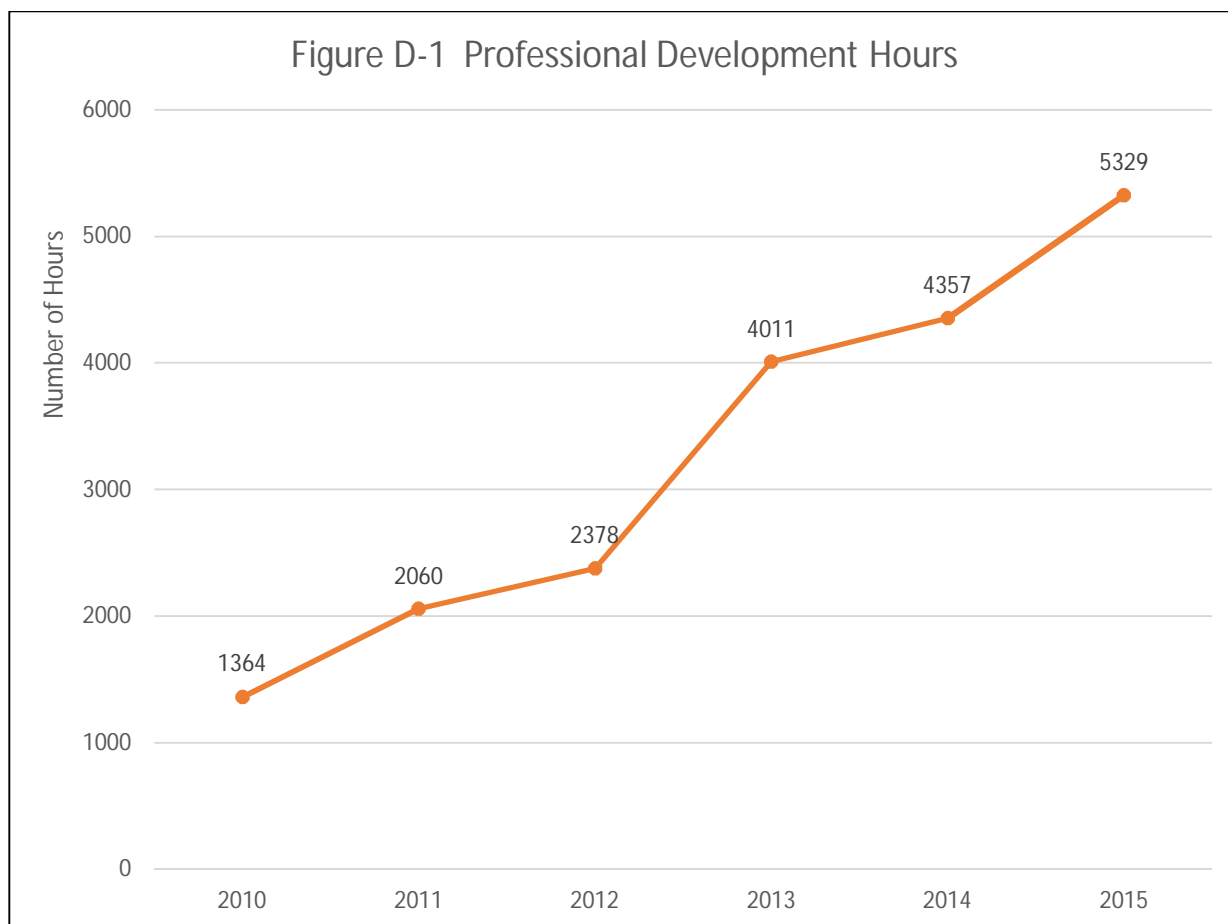
The figure shows a continuous, linear increase in the number of professional development hours provided since 2010, continuing the trend from earlier years.   FLATE surveys its professional development workshops and Overall satisfaction with all FLATE workshops are consistently ranked in the 4 (Very Good) to 5 (Excellent) range for attendee satisfaction scores by participants. External surveys, when available, provide useful comparatives, insight, and ideas for continuous improvement. Please refer to Appendix A.

Relating to Effectiveness Measure PDE-3 this period, there are two statewide forum models currently implemented. The first, FLATE continues to sponsor and support. The ET Forum continues to be a popular, well-attended event, which allows faculty direct interaction with Florida DOE program administrators, industry panels discussing their workforce needs, and professional development workshops. The ET Forum provides a viable means for industry and educators across the state to meet twice each year at different college locations to discuss

common interests and issues surrounding the education of tomorrow's advanced manufacturing workforce. Representatives from over half of Florida's colleges regularly attend. FLATE's sustainability plan describes a partner relationship with Hillsborough Community College to take over and continue implementation of the ET Forum beyond the life of the FLATE grant.

The FLATE model for curricula topic Forums (i.e. ET Forum) among the state and community colleges has been duplicated in Florida. In 2008, Florida legislation was enacted which among other directives, commissioned FLATE to partner with the Florida Energy Systems Consortium (FESC) to prepare and execute a technician workforce plan that will put an alternative energy workforce in place. One of the specific accomplishments of this partnership has been the design, development, and implementation of the second statewide forum model, the annual Community and State Colleges Energy Education Workshop and Forum. Since then two additional Forums have been developed and implemented in Florida. These specifically are one Forum for Fire Fighter education and one for aerospace.
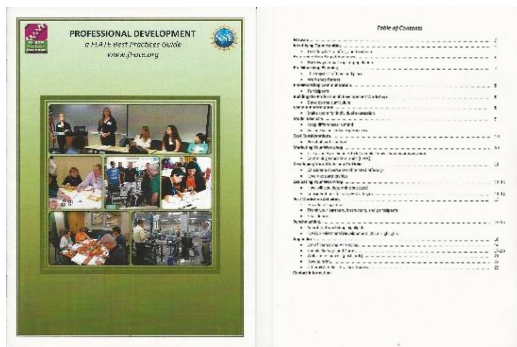
Addressing Effectiveness Measure PDE-4: FLATE continues to distribute a guide for its FLATE Best Practices Series: *Professional Development*. The guide, as are all FLATE best practices guides, is available free of charge as an online flipbook or in print copy by request. It is disseminated at appropriate conferences and workshops. FLATE professional development experiences provide a practical understanding of advanced manufacturing and bring the opportunity of working with real equipment to Florida educators, who in turn relay these experiences to their students.

Appendix A, a brochure summarizing FLATE Professional Development activities in 2015, addresses Effectiveness Measure PDE-5. It lists many of the professional development activities initiated, coordinated, and supported by FLATE. These include ET Summer Institute, FLATE Summer Camp for Teachers, and much more.

III. Summary

Based on outcome data and program implementation evaluation as assessed by the Florida Sterling criteria, FLATE is a high performing organization. As the end of the grant period draws closer, FLATE leadership and staff continue to focus on mission sustainability and continuous improvement of activities and processes. A wide range of partnerships have been developed alongside a leadership and management system that is intent on listening to the voice of stakeholders for new opportunities and refinement of current approaches in every aspect of FLATE operations. The organization is outwardly focused, finding means to share best practices within Florida and nationally, supporting and facilitating activity around the country to enhance technical education of the manufacturing workforce. FLATE has been recognized as a high performer as demonstrated by a range of awards earned by the organization, as well as the number of inquiries and requests made for mentoring assistance for developing similar programs in colleges across the country.

The leadership team has a clear vision for sustainability of important elements of the FLATE mission, and systematically seeks opportunities for sustainability options. Customer and stakeholder focus is embedded in the culture of FLATE leadership and staff. This annual evaluation demonstrates the results, culture, and capacity to fulfill its mission and meet the needs of the National Science Foundation (NSF), its customers, and stakeholders. Performance results validate FLATE's ability to gain the confidence of its stakeholders and engagement of partners. Engagement is exemplified in a number of ways, and corroborated by performance results in this report, such as ET degree program adoptions, comparisons of ET AS degree program enrollments and completions, and partner contributions to outreach to the community. Key strengths and opportunities for improvement are noted. The following comments summarize progress to date of the last reported areas of opportunity for improvement, and additional recommendations are made as deemed appropriate.

Previous Recommendations (In Progress or Accomplished):

- Look into collecting data regarding the accomplishment of technical credentials and certifications in comparative programs.

  Progress: FLATE effort in on this recommendation continues. However, FLATE has conducted and completed a nationwide collection of data that reflects on the MSSC-CPT credentials awarded in comparative programs. Collection of information about other national certifications relative to the ET degree specializations is underway and is still ongoing.

- The data show that female participation in high school technology programs, specifically the Automation and Production Technology program is trending unfavorably. The same is noted in ET and related program enrollment at the colleges. Effort should be made to increase female participation.

  Progress: This is reiterated as a revised recommendation in 2016 below.

- Refine approaches to the distributed sustainability model deployment to eliminate the expected gap in FLATE's mission beyond the life of the FLATE organization. Continue focus on the sustainability of mission, and the use of the sustainability matrix for prioritizing and describing potential opportunities and options. Build on the current FLATE investment in partnerships and engagement of partners, stakeholders, and customers.

  Progress: This is essentially accomplished with significant progress already made. It is reiterated as a revised recommendation in 2016 below. The FLATE NVC has recognized the sustainability planning approach as a best practice.

- Strengthen geographic ties and reinforce communication to assure interaction with a broader representation of stakeholders, as well as potential new partners, around the State. Data reported indicate weakness in Industry Advisory Committee attendance. Partnerships and engagement of partners is key to sustainability efforts.

  Progress: This continues to be an area for improvement. Stakeholder survey

results specifically identify geographic outreach as a high priority opportunity for improvement.

- Refine listening methods to improve Voice of the Customer activity to identify relevant stakeholder knowledge to support sustainability activity.

   Progress: This is ongoing. Some improvement in collecting greater detail in surveys has been recognized to be able to fine tune survey responses

New (or revised) Recommendations (in 2016):

- Reinforce current FLATE practices and develop new approaches that address and resolve weak recruitment of female students into the ET degree programs within the Florida State College System.

- Continue to refine approaches to the distributed sustainability model deployment to eliminate the expected gap in FLATE's mission beyond the life of the FLATE organization. Build new partnerships as necessary for assumption of key mission elements and functions.

- Collect data related to those Effectiveness Measures CE-2 and CE-11 not addressed 2015.

Appendix A

FLATE

Florida Advanced Technological Education Center of Excellence
www.FL-ATE.org ● www.MadeInFlorida.org ● www.flate.pbwiki.com

2015 FLATE Professional Development

The curriculum FLATE presents in its workshops reflects the current technical needs of industry, and can be made sustainable by the adoption of presented ideas into other resources used by STEM and career and technical educators, and passed along to students and other educators. FLATE professional development opportunities are offered throughout the year, with a particular focus over the summer where recurring and variable topic multiple day workshops such as the *ET Summer Institute, FLATE Summer Camp for Teachers, and FLATE presentations at the Florida Association for Career and Technical Education (FACTE)*conference take advantage of teachers' availability over the summer break. FLATE is a frequently requested partner/presenter for teacher professional study days, and provides workshops onsite at its host college, or offsite at local schools. In both 2014 and 2015, the Florida Association for Career and Technical Education (FACTE) co-sponsored the ET Summer Institute. In 2015, the ET Summer Institute focused on Advanced Manufacturing Careers with session topics which included session topics of interest to both educators and industry:

- *"Made in Florida"* video and activities
- FLATE's Manufacturing Curriculum
- Additive Manufacturing Activities
- *"Made in Florida"* Manufacturing Tours
- Overview of Manufacturing Credentials
- ET/ Engineering Pathways
- Interactive lunch with Manufacturers

The two top ranked activities were the manufacturing tours (4.8 out of 5.0) and lunch with manufacturers (4. 7 out of 5.0). We receive feedback and appreciation from both industry and educators for the opportunity to interact. ***It's a win-win situation which gives manufacturers a unique to chance to share the skill sets they are looking for in workers with the educators who are teaching tomorrows workers.***

It was a full summer of professional development! In addition to the ET Summer Institute, Florida Association for Industrial and Technical Educators (FAITE) partnered up with FLATE to provide a pre-conference workshop at the FACTE summer conference and trade show in July, which featured a tour to Jacksonville Port Authority and featured an Industry Panel where educators and industry had a chance to interact. The School District of Hillsborough County supported two FLATE robotics workshops for educators, and NSF-ATE Center Nano-Link presented and provided products for FLATE's 6th annual summer camp for teachers. Fall kept pace with a wealth of opportunities where FLATE provided professional development sessions and workshops: Florida High School High Tech (HSHT) Able Trust Conference, National Coalition of Advanced Technology Centers (NCATC) Conference, American Vacuum Society Science Educators Workshop, Annual ATE Principal Investigators (PI) Conference, STEM Central Florida, National Career Pathways Network (NCPN) Conference, STEMech Conference, M-STEM Workshop, and Association for Career and Technical Education (ACTE) Vision Conference were notable.
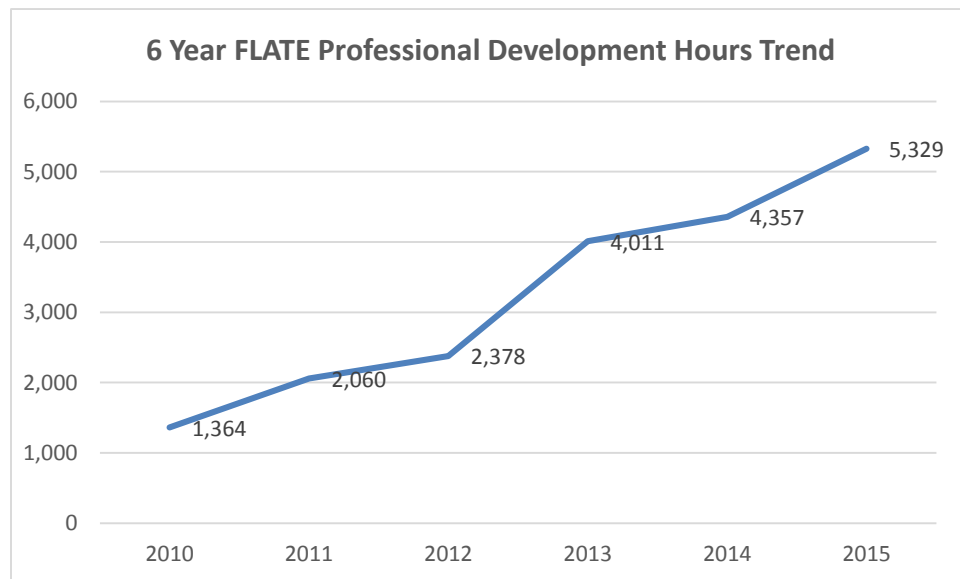
FLATE workshops have rich summer offerings, but our workshops are offered year 'round. Workshops addressing curriculum reform, statewide issues and curriculum frameworks typically include a representative from the Florida Department of Education, Career and Technical Education, who provides expertise and up to date information from an administrative perspective. The Fall 2015 ET Forum provided attendees with a PD workshop which gave ET faculty and administrators a chance to assist with the state review process of the ET degree, and provide valuable input. Professional Development workshops on Engineering Technology (ET) related topics are a regular part of the ET Forum collaborative, and a second round of the state review process is planned for Spring 2016.

Subject matter experts are invited to workshops as panelists, teachers, and to share relevant experience and best practices. *FLATE shares its professional development and workshop curriculum and instructional resources for educators through its free, online wiki* at www.flate.pbwiki.com. FLATE keeps professional development curriculum and resources current by monitoring trends in education and industry needs, through close association and feedback from a cohort of vendor-partners, through informal and formal focus group sessions at meetings, and by integrating manufacturing topics into STEM education so that more teachers, students, and parents are exposed to advanced manufacturing concepts. FLATE workshops often include an introduction to its unique and award winning industry connected educational resources.

In 2015 alone, FLATE has provided 5,329 hours of professional development to 1,135 college educators, 290 high school, 51 middle school, and 50 elementary school teachers as well as 481 workforce, economic and manufacturing personnel and other educators not reporting level. in addition to educational outreach to parents and community members at 132 events in Florida, nationally, and worldwide.

Professional Development (PD) Provided by FLATE 2010-2015

6 Year FLATE Professional Development Hours Trend

Year	Hours
2010	1,364
2011	2,060
2012	2,378
2013	4,011
2014	4,357
2015	5,329

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FLATE workshops are predominately attended by K-14 educators and staff, such as career counselors and administrators, who are attending FLATE workshops to add to their technical teaching toolkit, to learn more about STEM and advanced manufacturing subjects, related subjects and use of associated curriculum, college and career options for students, as well as glean recruitment ideas. In 2014 and again in 2015, FLATE observed several teachers who attended past FLATE workshops return to take additional workshops, such as the Robotics workshops which were provided in partnership with the School District of Hillsborough County (SDHC). In our workshops, we are seeing not only teachers from middle school and high school STEM programs, but elementary school science teachers, librarians, educators working with special groups such as AVID, gifted, and exceptional student education teachers all enrolling in FLATE professional development workshops to learn ways to integrate sTEm (emphasis on the T & E) into mainstream curriculum and connect their students to the high tech world around them.

FLATE partners with other ATE Centers to offer online webinars, thus expanding national and international opportunities. The Manufacturing Day planning webinars with MATEC, for instance served over 200 participants, and helped FLATE make a national impact. Over 100 participants attended the MATEC webinar, *Effective Approaches for Aligning Curriculum with Business Demand* with CCTA Centers Collaborative for Technical Assistance, where Dr. Barger presented a session. Due to using a different web portal platform for the CCTA webinar, survey results and participation profile are not available.

FLATE's *Recruiting Girls: Practitioners Perspectives* webinar featured elementary, middle, and high school teachers from Hillsborough county with exemplary STEM programs. Two female high school students presented along with their teacher. The participation was small (13) for this webinar, but included Hillsborough County Schools STEM director Larry Plank, who emailed his teachers and FLATE after the webinar saying, "You make a STEM director proud."

FLATE surveys its professional development workshops and ***Overall satisfaction with all FLATE PD workshops are consistently ranked in the 4 (Very Good) to 5 (Excellent) range for attendee satisfaction scores by participants.*** External surveys, when available, provide useful comparatives, insight, and ideas for continuous improvement. 2015 survey results and examples are provided throughout this section.

We have included for review a sampling of 2015 professional development workshops. Examples include a snapshot of summer offerings and details from some of the summer workshops as well as examples of workshops offered throughout the year. A list of 2015 workshops and side by side workshop evaluation ratings are provided. FLATE was thrilled when it's new "Made in Florida" Video 2015 release was invited to be "the movie" at USF STAVROS Center's December "Dinner and a Movie" professional development workshop which served a variety of teachers from Honors Physics to AVID (Achievement Via Individual Determination) College and Career Prep teachers. Teachers from Title 1 schools, teachers of the Gifted, and CTE Business teachers – the majority of whom (17 out of 25) ranked this professional development workshop a "perfect 5." FLATE will follow up with these teachers in 2016 to find out more about how they used the "Made in Florida" video and associated curriculum guide with their students, and report on those findings next year.

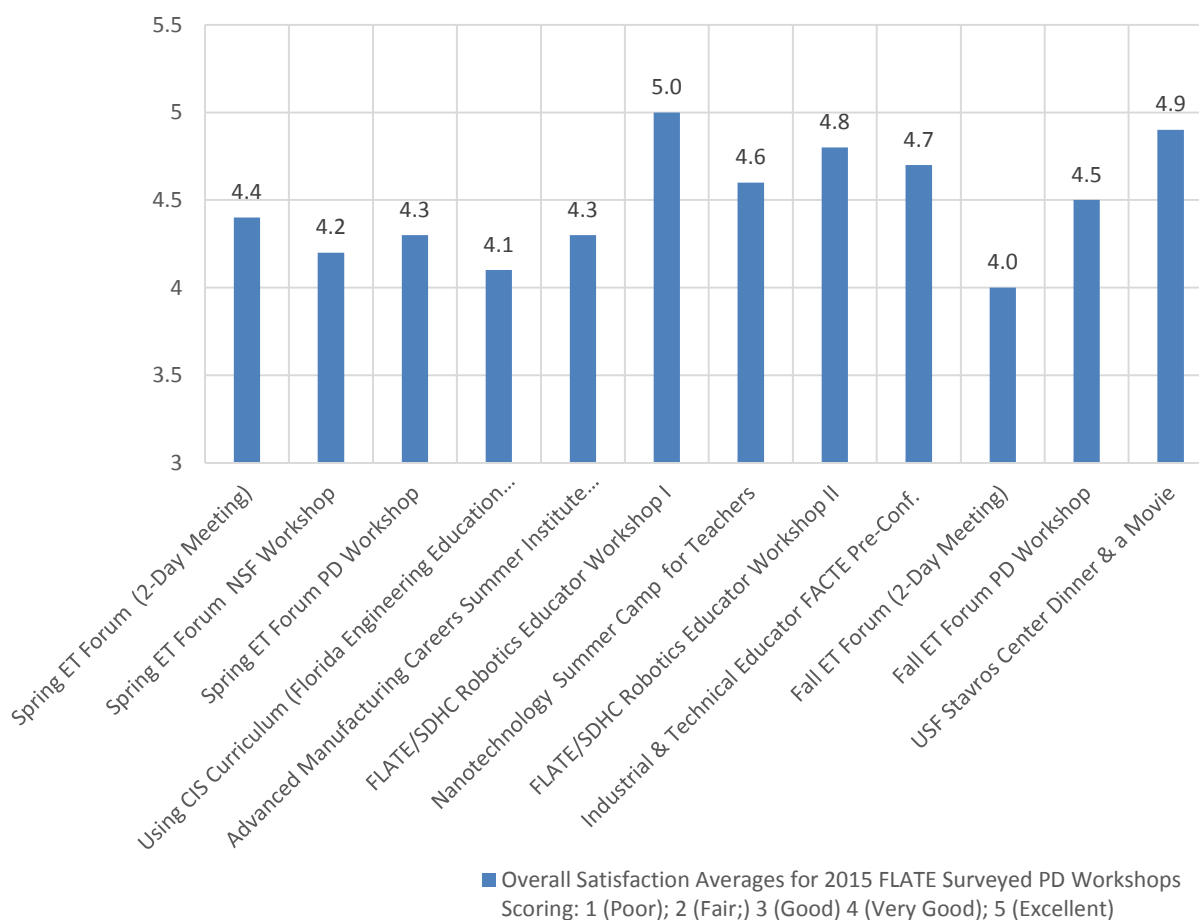2015 professional development activities and workshops included:

Event Name	Total PD Hours
Industrial Advisory Committee (IAC) Meeting at Sypris	28
Conference for Industry/Education Collaboration (CIEC)	8
College of Central Florida Open House	20
Ann Arundel TAACCCT Mechatronics Team Meeting-Lab & FLATE tour	10
League of Innovation Annual Conference Presentations	38
Middleton High School STEM Event	25
Effective Approaches for Aligning Curriculum with Business Demand with Centers Collaborative for Technical Assistance (CCTA)	501
ET Forum Florida Keys Community College	835
MFG DAY Webinar	61
American Association of Community Colleges (AACC) Annual Conference	150
Florida Education Engineering Conference	24
Industrial Advisory Committee (IAC) at Monin	43
Junior Scholars Robotics Workshop Series	6
Bright Minds Education Workshops	133
National Association for Workforce Improvement (NAWI) Saratoga Springs	22
National Institute for Staff & Organizational Development (NISOD) Conference	25
Recruiting Girls: Practitioners Perspective Webinar	35
Junior Scholars Robotics Workshop Series	6
American Vacuum Society Education Committee	25
FLATE-FACTE Advanced Manufacturing Careers Institute	270
American Vacuum Society Education Committee	19
Florida Energy Teachers Network Workshop	8.5
Nanotechnology Summer Camp for Teachers	48
Annual Summer Institute for PACE Mechatronics Grant	12
MFG Day Educator Webinar	175
Florida Association of Career and Technical Education (FACTE) Annual Conference	131
HiTech Annual Conference	348.5
Robotics Educator Training	259
Florida TRADE Qtrly Meeting	25
DL Jamerson Elementary School Engineering Workshop	120
School District of Hillsborough County (SDHC) Teacher Professional Study Day	13
MFG DAY Promotions	5.5
American Society of Quality (ASQ) Meeting Toothpick Factory	16
IAC Meeting at MicroLumen	43
SDHC Solidworks for Teachers	66.5

ET Forum at Valencia College	612
National Coalition for Advanced Technology Centers Fall Conference	22
AbleTrust High School High Tech Annual Conference (tour, TF & curriculum workshop)	99
Centers Collaborative for Technical Assistance (CCT) Webinar	25
Annual Science Educator Workshop (SEW)	432
NSF ATE PI Meeting	80
NCPN Conference	264
STEMtech Conference	180
USF Stavros Center Dinner & a Movie (featuring FLATE's new MIF video)	30
ACTE Conference	30
Total 2015 PD Hours	5,329

FLATE and external partners typically provide satisfaction surveys at the end of workshops to provide a means of continuous improvement and to ensure FLATE is meeting the needs of attendees.

Overall Satisfaction for 2015 PD Workshop Participants Responding to End of Event Surveys

Workshop	Score
Spring ET Forum (2-Day Meeting)	4.4
Spring ET Forum NSF Workshop	4.2
Spring ET Forum PD Workshop	4.3
Using CIS Curriculum (Florida Engineering Education…)	4.1
Advanced Manufacturing Careers Summer Institute…	4.3
FLATE/SDHC Robotics Educator Workshop I	5.0
Nanotechnology Summer Camp for Teachers	4.6
FLATE/SDHC Robotics Educator Workshop II	4.8
Industrial & Technical Educator FACTE Pre-Conf.	4.7
Fall ET Forum (2-Day Meeting)	4.0
Fall ET Forum PD Workshop	4.5
USF Stavros Center Dinner & a Movie	4.9

Overall Satisfaction Averages for 2015 FLATE Surveyed PD Workshops
Scoring: 1 (Poor); 2 (Fair;) 3 (Good) 4 (Very Good); 5 (Excellent)

Workshops provided at external venues do not typically provide us with specific survey feedback, but we were fortunate to have 3 external surveys for this year's workshop. The NanoLink workshop at the summer camp for teachers provided an in depth survey. Since it is dissimilar to ours and other external surveys, please find it following the FLATE Summer Camp for Teachers on page XX. USF Stavros Center "Dinner & a Movie" featuring the new release of the "Made in Florida" video is also highlighted separately in greater detail.

Rating Averages for Four 2015 Externally Surveyed FLATE PD Workshops

	HiTEC Conference Roadmap to Mechatronics	Able Trust High School /High Tech FLATE Educational Resources Keynote	Able Trust High School /High Tech FLATE College Lab Tour at Seminole State College	Able Trust High School /High Tech FLATE Toothpick Factory
Rating	3.1	3.7	3.95	3.8

■ Rating Averages for Four 2015 Externally Surveyed FLATE PD Workshops
Scoring: 1 (Strongly Disagree); 2 (Disagree); 3 (Agree); 4 (Strongly Agree)

Four external workshops this year provided surveys using a scale of 1 to 4 (with 4 being highest) which FLATE can use for benchmarking. These external surveys provide a comparative for FLATE's professional development workshop survey which uses a scale of 1 to 5 (with 5 being highest).

The Annual HiTEC Conference Roadmap to Mechatronics: Programming with PLCs

This workshop focused on the important integrating aspect of communications in mechatronics systems. Three hands-on activities will fill most of the workshop with basic PLC programming exercises developed to demonstrate the applicability of small, affordable trainers to larger trainers and industrial systems. Ultimately, small trainers can expand delivery options of PLC courses. Currently, remote students must settle for working with online or computer-based simulations or occasional travel to a college lab for hands-on experiences. The session closed with facilitated discussions of ways to integrate this equipment into mechatronics programs and opportunities for outreach and professional development. The session was presented by: Marilyn Barger, FLATE, Tampa, FL; Alessandro Anzalone, Hillsborough Community College, Tampa, FL; Ernie Friend, Florida State College, Jacksonville, FL; Dan Horine, Virginia Western Community College, Roanoke, VA

23 surveys were collected from the HiTEC workshop with an overall average of 3.1 where 3.0 = agree and 4.0 = strongly agree. Strengths were instructor knowledge (3.6) and the hands-on aspect (not ranked). Lower participant rankings suggested improvements can be made in the printed materials (pages were missing/not proofed); workshop moved fast and beginners could have used more time. FLATE finds these types of comments invaluable for our goals of continuous improvement.

FLATE was a keynote speaker, facilitated a session, and presented a workshop session at Able Trust's Annual High School/High Tech (HS/HT) Conference. The keynote session introduced participants to FLATE's educational resources and received a very high rating of 3.7 out of 4.0 for the 35 surveys collected. Additional highly rated FLATE sessions at this conference included a tour to the high tech labs at Seminole State College (n=18) which received an exceptional rating of 3.95 out of 4.0 and was listed in the comments as a high point of the conference. Following the tour, FLATE's famous Toothpick Factory session was rated 3.8 out of 4.0: participants felt that the "soft skills" materials presented in this this session will be helpful in their jobs and be useful right away.