2006-2011 Florida Engineering Technology and Related Program Enrollment and Completion

FLATE, a National Science Foundation Regional Center of excellence, annually compiles enrollment and completion data for the Engineering Technology (ET) and related degree and college credit certificate (CCC) programs for Florida colleges, and for related programs at the PSAV and secondary level. These data, provided by the Florida Department of Education, are reliable, but do not include enrollments for undeclared majors. College Registrar reporting/cut dates also result in reported enrollment discrepancies. Minor anomalies may occur as older program titles are collapsed and new program titles are added. This review contains six sections and an appendix with individual ET adopting college performance. This report was compiled 12/15/2011 for the 2010-11 FLDOE report year.

I. Total Engineering Technology and Related Technology Program Enrollment: AA/AAS and Certificates; BS Degrees, Selected Demographic Profile

II. Engineering Technology and Related Technology College Degree Enrollment and Completion by Program

III. Engineering Technology and Related Technology College Credit Certificate Enrollment & Completion by Program

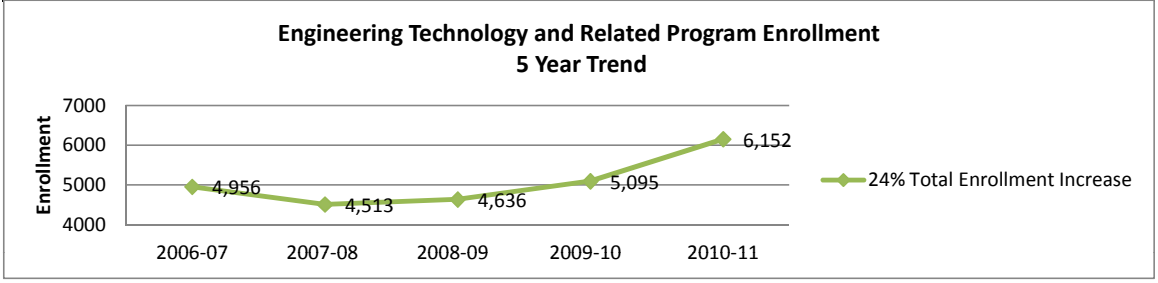
IV. Secondary Level Technology Enrollment by Program

V. Secondary Level Technology Program Demographics including Internships and Completion

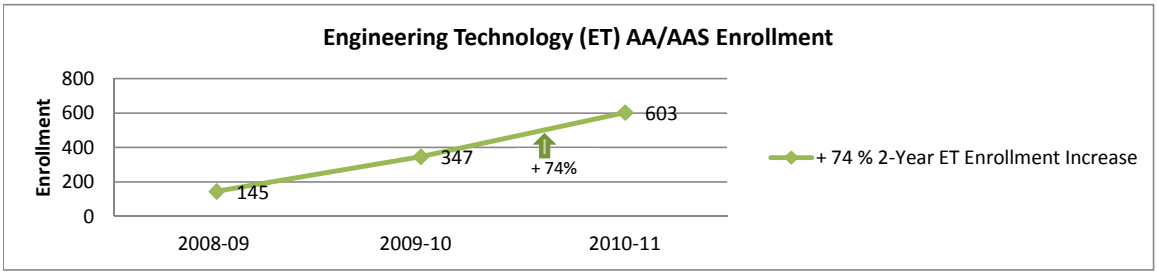
VI. Post-Secondary Adult Vocational (PSAV) Enrollments, OCP, and Completions

Appendix: 5-Year Engineering Technology and related Technology Program Enrollment Trend by College with breakout detail for Colleges Adopting ET Degree and Certificate Programs including Adoption Year

I. Total Engineering Technology and Related Technology Program Enrollment: AA/AAS and Certificates 5 Year Trend (for 25 Florida Colleges)	2006-07	2007-08	2008-09	2009-10	2010-11
	4,956	4,522	4,636	5,095	6,152



Enginnering Technology AA/AAS program Breakout	2008-09	2009-10	2010-11	2 Year % Change
Engineering Technology (ET) AA/AAS Enrollment	145	347	603	+74%
Number of Colleges Adopting the Program	7	9	10	+43%



Total ET Bachelor Degree Program Enrollment (Currently Offered at 2 Florida Colleges):	2010-11
Engineering Technology & Electronics Engineering Technology (new baseline measure)	204

Selected Demographic Profile of Enrollment for Total ET and Related College Programs *

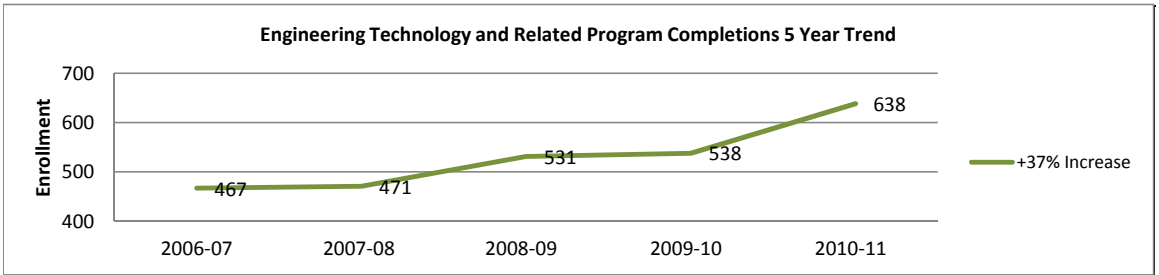
ET and Related College Degree and Certificate Programs			% Change	2009-10	2010-11
Technology Program Total Enrollment			+21%	5,095	6,152
Male			+ 28%	3,849	4,802
Female			+8%	1,228	1,323
Unreported Gender				18	27
% Female of Total Enrollment			-2%	24%	22%
% White Students				60%	55%
% Minority Students			+5%	40%	45%

*New measurement and tracking by FLATE beginning 2009 -10 report year.

This material is based upon work supported by the National Science Foundation (NSF) under Grant No. 0802436.
Any opinions, findings, conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of NSF.

II. Engineering Technology and Related Technology Enrollment by Program ( ) Indicates Number of Colleges Offering the A.S./A.A.S. Degree in 2010-11 Academic Year					
A.S./A.A.S. Degree Programs	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**
(8) Engineering Technology (ET) Degree Enrollment			**145**	**347**	**603**
FLDOE does not provide enrollment by specialization. (n) represents colleges offering these A.S/A.A.S. Degrees for the report year.					
(1) Aerospace Technology	80	90	89	86	67
(5) Biomedical Engineering Technology	322	261	239	365	466
(2) Chemical Technology	192	206	342	547	646
(3) Computer Integrated Manufacturing	132	96	73	59	58
(17) Drafting & Design Technology	1,618	1,482	1,286	1,207	1,148
(3) Electrical Distribution Technology*					41
(3) Electrical Power Technology *					335
(15) Electronics Engineering Technology	1,406	1,053	1,152	1,271	1,348
(15) Industrial Management Technology	703	690	694	761	805
(4) Manufacturing Technology	99	70	62	33	33
(1) Simulation and Robotics Technology		50	48	38	29
(2) Supply Chain Management*					9
Total Degree Enrollment /ET and Related	**4,552**	**3,998**	**4,130**	**4,714**	**5,588**
* Added to 2010-11 Report					

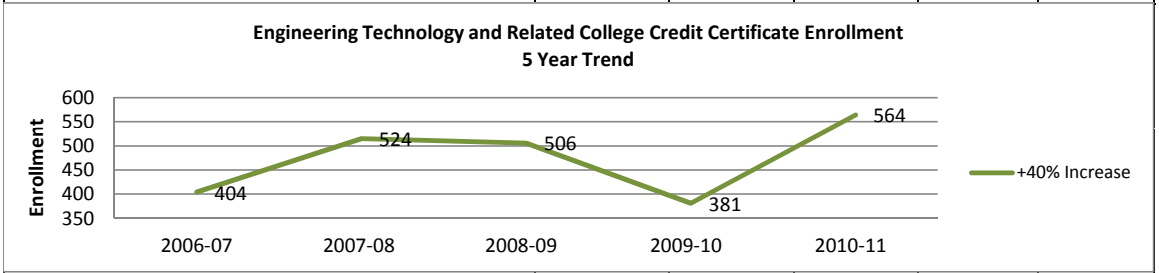
Engineering Technology and Related Technology College Degree Completion by Program					
A.S./A.A.S. Degree Completion	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**
Aerospace Technology	10	6	15	11	18
Biomedical Engineering Technology	28	24	23	30	35
Chemical Technology	9	17	13	19	34
Computer Integrated Manufacturing	28	7	8	6	5
Drafting & Design Technology	107	110	121	124	132
Electrical Distribution Technology*					1
Electrical Power Technology *					45
Electronics Engineering Technology	86	65	117	93	123
Engineering Technology			**7**	**14**	**37**
Industrial Management Technology	192	239	222	237	199
Manufacturing Technology	7	1	4	3	5
Simulation Technology		2	1	1	4
Total College Completion	**467**	**471**	**531**	**538**	**638**



III. Engineering Technology and Related Technology Certificate Enrollment & Completion by Program					
( ) Indicates the number of schools currently offering the certificate					
ET Program Certificate Enrollment	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**
(1) CCC - Alternative Energy Systems Specialist (new program)					10
(1) CCC - Applied Technology Specialist		46	36	13	12
(1) CCC - Automation				2	5
(2) CCC - CNC Machinist		1	2	5	12

This material is based upon work supported by the National Science Foundation (NSF) under Grant No. 0802436.
Any opinions, findings, conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of NSF.

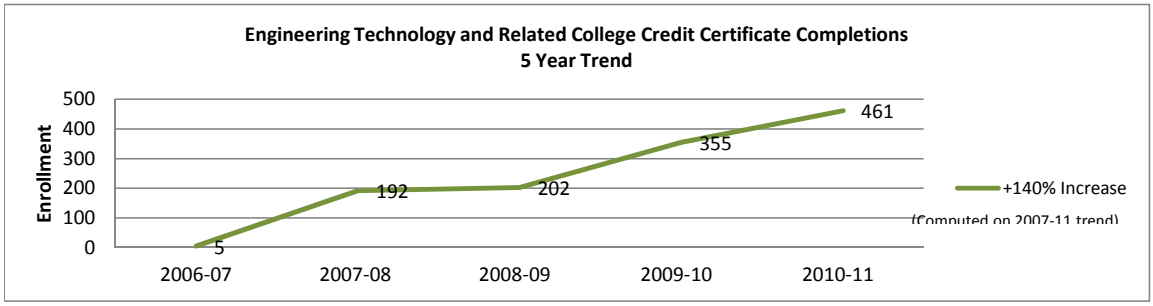
ET Program Certificate Enrollment	2006-07	2007-08	2008-09	2009-10	2010-11
(1) CCC - Composite Fabrication & Testing (new program)					1
(1) CCC - Computerized Woodworking			1	0	0
(5) CCC - Engineering Technology Support Specialist		9	22	20	16
(1) CCC - Lean Manufacturing				20	1
(2) CCC - Lean Six Sigma Green Belt		25	16	12	21
(1) CCC - Robotics and Simulation Technology (new program)					1
(1) CCC - Six Sigma Black Belt		22	13	5	11
Total ET Program Certificate Enrollment		**103**	**90**	**77**	**90**
Related Technology Program Certificate Enrollment by Program					
(2) CCC - Alternative Energy Engineering Technology (new program)					7
(13) CCC - AutoCAD Foundations	395	337	328	245	269
(2) CCC - Chemical Laboratory Specialist	9	7	6	15	10
(1) CCC - Electrical Distribution, Advanced					7
(1) CCC - Electrical Distribution, Basic					8
(3) CCC - Electronics Technician, Basic		49	55	28	129
(3) CCC - Electronics Technician		15	21	13	26
(1) CCC - Laser and Photonics Technician		13	6	3	8
(2) CCC - Logistics & Transportation Specialist (new program)					9
(1) CCC - Scientific Workplance Prep					1
Related Technology Program Certificate Enrollment	**404**	**421**	**416**	**304**	**467**
Total ET & Related Certificate Enrollment	**404**	**524**	**506**	**381**	**564**



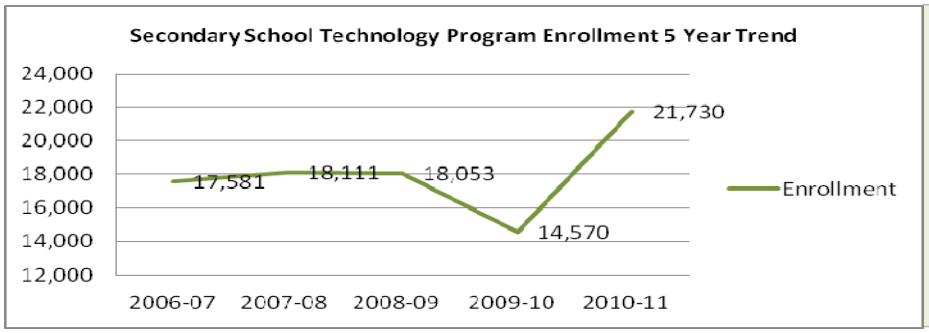
ET Certificate Completion by Program	2006-07	2007-08	2008-09	2009-10	2010-11
CCC - Alternative Energy Systems Specialist (new program)					1
CCC - Applied Technology Specialist		25	21	22	2
CCC - Automation				2	5
CCC - CNC Machinist		1	2	7	11
CCC - Composite Fabrication & Testing (new program)					13
CCC - Computerized Woodworking				1	2
CCC - Electronics Aide				9	1
CCC - Engineering Technology Support Specialist		5	36	36	35
CCC - Lean Manufacturing				20	0
CCC - Lean Six Sigma Green Belt		26	33	24	33
CCC - Six Sigma Black Belt		33	27	22	25
Total ET Certificate Completion by Program		**90**	**119**	**143**	**128**
Related Technology Certificate Completion by Program					
CCC - AutoCAD Foundations				161	167
CCC - Basic Electronics Technician		92	52	24	111
CCC - Electronics Technician			26	8	12
CCC - Chemical Laboratory Specialist	5	2	2	6	4

This material is based upon work supported by the National Science Foundation (NSF) under Grant No. 0802436.
Any opinions, findings, conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of NSF.

Related Technology Completion by Prog.	2006-07	2007-08	2008-09	2009-10	2010-11
CCC - Electrical Distribution, Basic					13
CCC - Laser And Photonics Technician		8	3	2	8
CCC - Logistics & Transportation Specialist (new program)					5
CCC - Scientific Workplance Prep				11	13
Related Technology Program Certificate Enrollment	**5**	**102**	**83**	**212**	**333**
Total Certificate Completion/ET & Related	**5**	**192**	**202**	**355**	**461**



IV. Secondary Level Technology Enrollment by Program*					
	2006-07	2007-08	2008-09	2009-10	2010-11
Number of Programs Offered	**521**	**548**	**541**	**380**	**612**
Total Enrollment	**17,581**	**18,111**	**18,053**	**14,570**	**21,730**



*Not all programs reported and tracked in 2010-2011 were previously reported: refer to following detailed program list. Enrollment without the new additions = 13,209

Note: New manufacturing related technology programs were added to the report for 2010-11 to provide a more comprehensive baseline and add perspective to the advanced manufacturing technology pipeline.

Secondary Enrollment by Technology Program					
Program Title	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**
*Applied Welding (new to report)					1,157
Automation & Production Technology (New program adopted by FLDOE in 2010)				37	26
*Electronic System Assembly (new to report)					5
Electronics Technology	692	675	626	603	635
Engineering Assisting	315	347	291	351	283
Engineering Technology	6,139	8,134	8,522	6,853	6,438
Industrial Biotechnology			229	285	201
Industrial Machinery Maintenance	35	204	164	**22	228
Machining (new to report)					175
*Pathways to Engineering (new to report)					7,362
Materials and Processes Technology	5,576	4,661	4,602	3,942	3,030
Production Technology	2,093	1,868	1,717	1,584	1,440
*Precision Metal Fabrication (new to report)					1
*Sheet Metal Fabrication Technology (new to report)					1
Solar Energy Technology (new program adopted by FLDOE in 2011)					78
Technology Systems	2,731	2,222	1,902	915	670
Total Enrollment by Program	**17,581**	**18,111**	**18,053**	**14,592**	**21,730**

** 22 reported enrollment for 2009-10 confirmed

This material is based upon work supported by the National Science Foundation (NSF) under Grant No. 0802436.
Any opinions, findings, conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of NSF.

V. Secondary Technology Program Demographics					
Secondary Technology Programs	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**
Technology Program Total Enrollment	17,581	18,111	18,053	14,592	21,730
Male	14,625	15,291	15,050	12,183	18,241
Female	2,956	2,820	3,003	2,409	3,489
% Female of Total Enrollment	17%	16%	17%	17%	16%
% White Students	53%	53%	51%	49%	50%
% Combined Other Minority Students	47%	47%	49%	51%	50%
Technology Program Total Graduates	3,079	3,114	3,042	2,732	3,626
% Technology Program Graduates	18%	17%	17%	19%	17%
Male Graduates	2,515	2,530	2,472	2,231	3,029
Female Graduates	564	584	570	501	597
% Female of Total Graduates	18%	19%	19%	18%	17%
% White Students	70%	54%	53%	48%	50%
% Combined Minority Students	30%	46%	47%	52%	50%
Total Internships	1,951	288	229	262	250
Males Placed in Internships	1,478	238	174	182	158
Females Placed in Internships	473	50	55	80	92
% Females Placed in Internships	24%	17%	24%	31%	37%

VI. Post-Secondary Adult Vocational (PSAV) Enrollments, OCP, and Completions					
PSAV FLDOE Report Categories	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**
Enrollment	346	425	371	359	*1577
Occupational Completion Point (OCP) Earners	290	414	333	340	2,279
Full Program Completer	37	34	33	43	522
Number of Programs	18	15	5	5	9
Number of Participating Institutions	11	8	9	12	30

*Not all programs reported and tracked in 2010-2011 were previously reported: refer to following detailed program list.

Applied Welding Technologies (new to report)					1,175
Automation & Production Technology (New program adopted by FLDOE in 2010)					6
Electromechanical Technology					92
Electronic System Assembly (New to Report)					1
Industrial Machinery Maintenance					50
Industrial Technology					8
Machining					148
Solar Energy Technology (New to Report)					66
Solar Thermal Design, Installation, & Maintenance (New to Report)					31
Total PSAV Manufacturing Related Technology Program Enrollment					**1,577**

Enrollments new to the report = 1,273; Enrollment without the new additions = 304

Note:

As reported in 2010, FLDOE does not provide long-term tracking and cross-referencing with the FETPIP employment records at this time, although a startup for this ability was mentioned on the FLDOE website as planned for start-up in 2012.

FLDOE remains unable to provide MSSC cross-referencing.

This material is based upon work supported by the National Science Foundation (NSF) under Grant No. 0802436.
Any opinions, findings, conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of NSF.

Appendix: 5-Year Technology related Enrollment Trend* by College with breakout for Colleges Adopting ET Degree and Certificate Programs with Adoption Year

ET and Related Technology A.S./A.A.S. and Certificate Enrollment by College

Source: FL DOE Data Report

Highlight indicates adoption of ET Degree	2006-07	2007-08	2008-09	2009-10	2010-11
Brevard Community College	465	584	750	967	1082
Broward College	252	138	144	176	212
College of Central Florida	94	95	109	101	109
Chipola College	11	12	8	0	0
Daytona State College	228	313	257	203	225
Edison State College	249	294	265	247	222
Florida Gateway College				2	23
Florida State College at Jacksonville	380	311	256	405	430
Gulf Coast State College	127	107	113	113	128
Hillsborough Community College	182	216	257	288	337
Indian River State College	219	239	326	330	370
Lake Sumter Community College (new to this report)					40
Miami Dade College	505	273	256	269	485
Northwest Florida State College	464	365	361	332	313
Palm Beach State College	207	81	63	70	199
Pasco-Hernando Community College	108	110	85	87	80
Pensacola State College	192	172	167	169	202
Polk State College*	1			14	82
Santa Fe College	73	89	100	157	205
Seminole State College of Florida	108	103	108	84	78
South Florida Community College	26	27	29	43	54
St. Johns River State College	33	32	46	66	51
St. Petersburg College	252	258	225	205	259
State College of Florida Manatee-Sarasota	99	116	116	136	138
Tallahassee Community College	267	145	106	102	135
Valencia Community College	414	442	489	529	693
Total Enrollment for all Institutions	**4,956**	**4,522**	**4,636**	**5,095**	**6,152**

* Reported data anomaly confirmed with FLDOE; (1) in 2006-07 does not reflect actual enrollment

Breakout for Colleges Adopting the Engineering Technology Degree Program

Note: Breakdown between ET AS/AAS degree and certificates and technology related AS/AAS degree and certificates was started in 2009-10 due to the growth of the ET program. Some programs are too new to display FLDOE trend data.

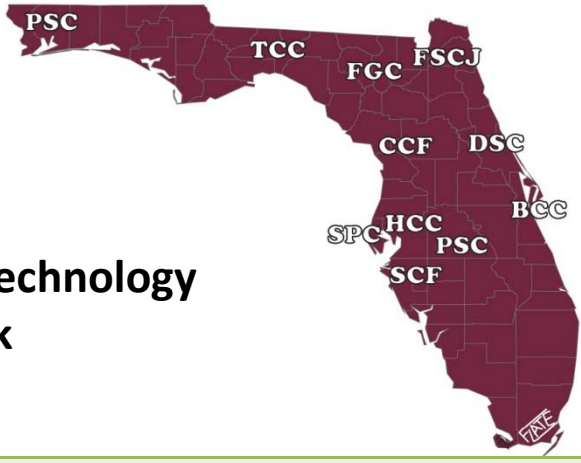
College Name and Enrollment Type	2006-07	2007-08	2008-09	2009-10	2010-11
Brevard Community College (BCC) Adopted 2008					
ET AS/AAS Degree Enrollment				138	199
ET Certificate Enrollment				16	25
Related AS/AAS Degree Enrollment				784	841
Related Certificate Enrollment				29	17
Total	465	584	750	967	1,082
College of Central Florida (CCF) Adopted 2008					
ET AS/AAS Degree Enrollment				37	42
ET Certificate Enrollment				2	2
Related AS/AAS Degree Enrollment				62	65
Related Certificate Enrollment					
Total	94	95	109	101	109
Florida State College at Jax (FSCJ) Adopted 2009					
ET AS/AAS Degree Enrollment				47	70
ET Certificate Enrollment				3	16
Related AS/AAS Degree Enrollment				340	324
Related Certificate Enrollment				15	20
Total	380	311	256	405	430

This material is based upon work supported by the National Science Foundation (NSF) under Grant No. 0802436.
Any opinions, findings, conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of NSF.

College Name and Enrollment Type	2006-07	2007-08	2008-09	2009-10	2010-11
Florida Gateway College (FGC) Adopted 2009					
ET AS/AAS Degree Enrollment				2	10
ET Certificate Enrollment					1
Related AS/AAS Degree Enrollment					6
Related Certificate Enrollment					6
Total				2	23
Hillsborough Community College (HCC) Adopted 2008					
ET AS/AAS Degree Enrollment				6	14
ET Certificate Enrollment *				20	2
Related AS/AAS Degree Enrollment				218	259
Related Certificate Enrollment				44	62
Total	182	216	257	288	337
*90% loss of ET certificate enrollment is due to completion by CASS student cohort.					
Pensacola State College (PSC) Adopted 2008					
ET AS/AAS Degree Enrollment					
ET Certificate Enrollment				5	7
Related AS/AAS Degree Enrollment				157	192
Related Certificate Enrollment				7	3
Total				169	202
Polk State College (PSC) Adopted 2009					
ET AS/AAS Degree Enrollment				5	42
ET Certificate Enrollment					
Related AS/AAS Degree Enrollment				9	40
Related Certificate Enrollment					
Total				14	82
St. Petersburg College (SPC) Adopted 2008					
ET AS/AAS Degree Enrollment				90	128
ET Certificate Enrollment				31	36
Related AS/AAS Degree Enrollment				77	87
Related Certificate Enrollment				7	8
Total	252	258	225	205	259
State College of Florida Manatee-Sarasota (SCF) (Adopted 2009)					
ET AS/AAS Degree Enrollment					98
ET Certificate Enrollment					
Related AS/AAS Degree Enrollment				136	40
Related Certificate Enrollment					
Total	99	116	116	136	138
Tallahassee Community College (TCC) (Adopted 2011)					
ET AS/AAS Degree Enrollment *					
ET Certificate Enrollment					
Related AS/AAS Degree Enrollment					135
Related Certificate Enrollment					
Total					135

*No ET data available due to adoption after the FLDOE report year data run.

This material is based upon work supported by the National Science Foundation (NSF) under Grant No. 0802436.
Any opinions, findings, conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of NSF.

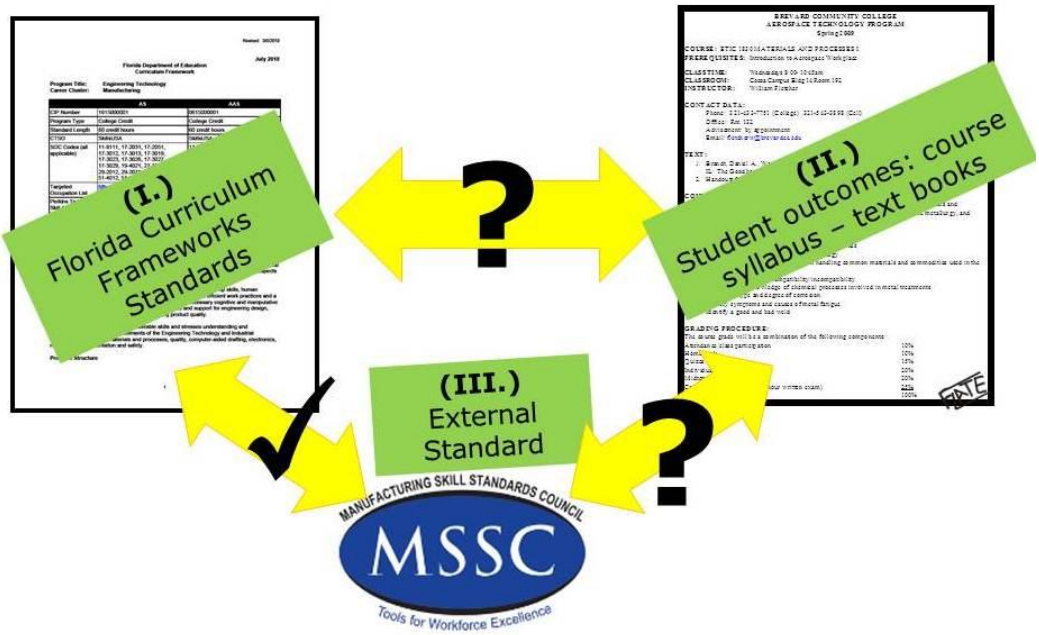


2011 A.S. Engineering Technology Degree College Network

College	Degree Specialization(s)	College Credit Certificate(s)
Brevard Community College (BCC)	• Electronics • Advanced Technology • Alternative Energy Systems	• Engineering Technology Support Specialist • Applied Technology Specialist • Alternative Energy Systems Specialist • Composite Fabrication and Testing
College of Central Florida (CCF)	• Quality	• Lean Six Sigma Green Belt • Computer Aided Drafting • Alternative Energy Systems Specialist
Daytona State College (DSC)	• *In Progress*	• *In Progress*
Florida State College @ Jacksonville (FSCJ)	• Advanced Manufacturing	• Engineering Technology Support Specialist • CNC Machinist
Hillsborough Community College (HCC)	• Advanced Manufacturing	• Engineering Technology Support Specialist • Automation • Lean Manufacturing • Engineering Technology Support Specialist
Florida Gateway College (FGC)	• Quality	• Engineering Technology Support Specialist • Lean Six Sigma Green Belt • Six Sigma Black Belt
Pensacola State College (PSC)	• Mechanical Design & Fabrication	• CNC Machinist / Operator • Computerized Woodworking • Mechanical Designer/ Programmer
Polk State College (PSC)	• Advanced Manufacturing	
St. Petersburg College (SPC)	• Electronics • Quality • Biomedical Systems • Digital Design & Modeling	• Engineering Technology Support Specialist • Lean Six Sigma Green Belt • Six Sigma Black Belt • Medical Quality Systems • Computer Aided Drafting • Rapid Prototyping and Design (sp 2012)
State College of Florida (SCF)	• Electronics • Digital Design & Modeling	• Engineering Technology Support Specialist • Alternative Energy Systems Specialist • Computer Aided Drafting • Electronics
Tallahassee Community College (TCC)	• *In Progress*	• Electronics Aid • Composite Fabrication and Testing • Lean Six Sigma Green Belt • Alternative Energy Specialist • CNC Machinist • Hydraulics, Pneumatics and Motors in Mfg

MSSC Alignment: Testing Outcomes

FLATE aligned the Engineering Technology (ET) Degree Curriculum frameworks, a state required and reviewed student standards document for the academic program, with the MSSC credential. This intense frameworks development process was needed to support the statewide articulation of the MSSC Credential to the degree program for college course credit. In addition, FLATE validated the alignment results with Florida industry to ensure that the ET degree program meets industry workforce needs.
However, alignment development and verification does not ensure that the competencies are taught or mastered in college classrooms. Faculties commonly use standard text books and text book driven academic course syllabi to formulate classroom lessons. Although there is often much overlap, as the figure below indicates, gaps do occur between the State Curriculum Frameworks (I.) and the academic course (II.) chosen by colleges to support the frameworks. Therefore, the skills needed for passing the MSSC certification test (III.) may also not be aligned to the academic courses (ET Degree core courses).

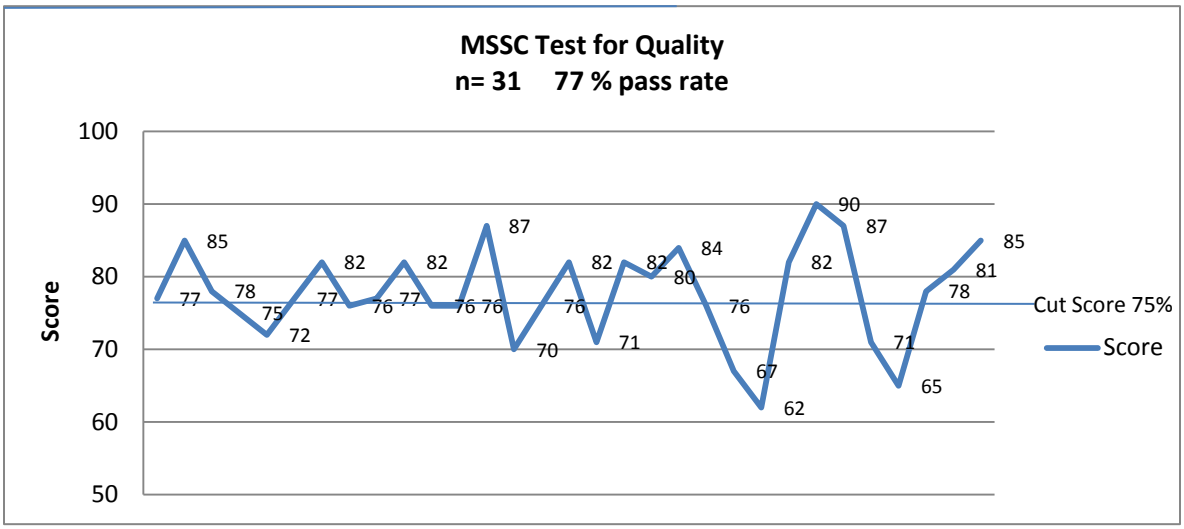


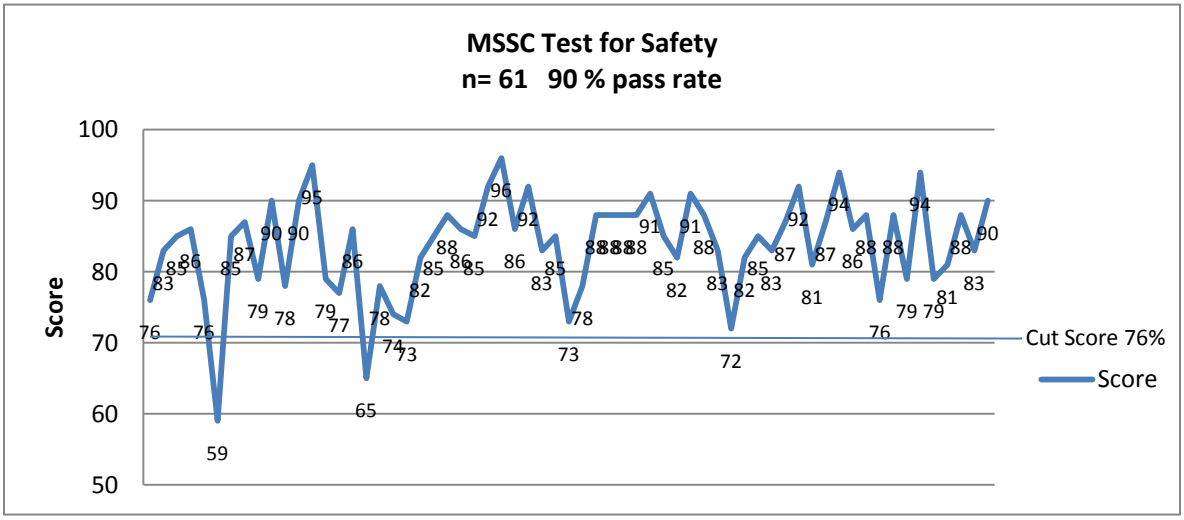
To close the alignment loop without insisting that faculty use a particular "packaged" or "test prep" curricula, MSSC test results from students in ET Core academic courses are being acquired, and results to date are reported on the next page. FLATE began this activity in the spring of 2010 by covering the test fees for any E.T. Degree student who takes the MSSC certification test set. FLATE will continue supporting college student testing until we validate that the integrated knowledge provided in the academic ET core courses prepare students for the aligned MSSC test. This project provides the needed data to assure that (II.) is aligned with (III.) and therefore, to (I.).

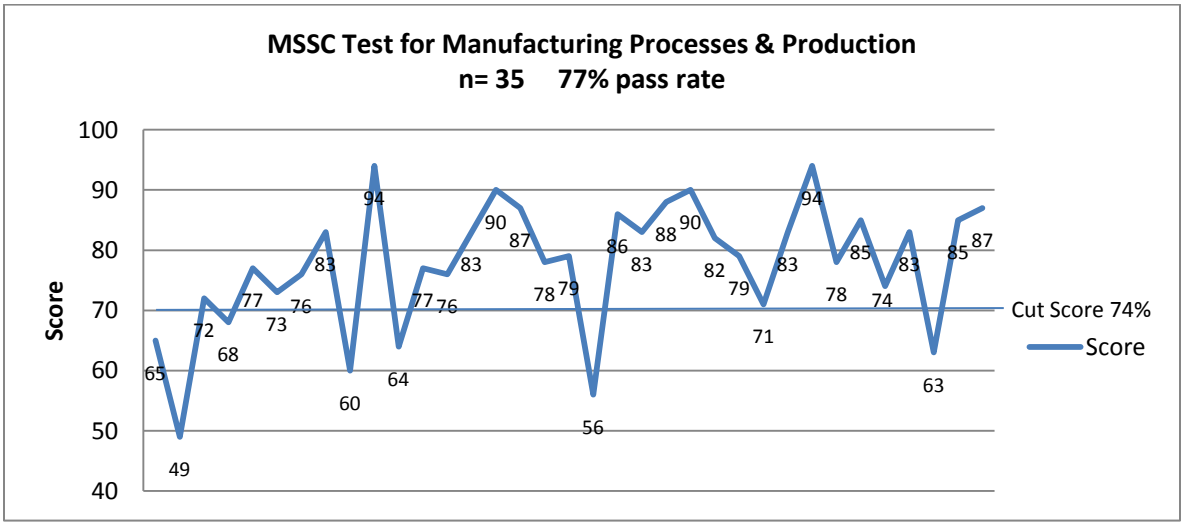
Test score results collected by FLATE through May 2011 showed some potential test performance gaps, indicating that targeted curriculum development and/or professional development activity might be needed. FLATE provided workshops addressing this issue at the Spring and Fall 2011 ET Forums. As a result of the workshops, common course outcomes have been reviewed for three core courses that align to both the state curriculum frameworks and the MSSC standards. Suggested course sequence for complete preparation for MSSC testing was also defined and agreed upon by the ET Forum group. Five colleges have reported results from three MSSC tests: Quality, Safety, and Manufacturing Processes and Production; results are summarized on the following graphs.

This material is based upon work supported by the National Science Foundation under Grant No. 0802436. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation

Test Results for Quality, Safety, and Manufacturing Processes and Production Tests through 12/2011







This material is based upon work supported by the National Science Foundation under Grant No. 0802436. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation

MSSC/FLDOE Frameworks/ ET Degree Technical Core Course Outcomes Alignment

These suggestions are the result of two ET Forum workshops addressing consistency in curriculum course outcomes which also meet MSSC assessment goals for Engineering Technology core courses aligned with MSSC Standards and FLDOE Frameworks AAS/AS CIP Numbers: Engineering Technology (AAS - 0615.000001) (AS - 1615.000001).

MSSC TEST	ET Core Course Topic Required/ Recommended before taking MSSC test
Safety	Industrial Safety
MSSC Quality Practices & Measurement	(1) Quality (2) Measurement
Manufacturing Processes & Production	(1) Safety, (2) Quality and (3) Manufacturing Processes
Maintenance Awareness	Test Criteria is covered under other courses as noted 9/30/11

ET Core Courses Used Throughout Florida

ET Core Course Topic	ET Courses Offering the Topic (Select One from each Core Area)
Safety	ETI 1701 ETI 1720C Industrial Safety BCN 2732 OSHA Safety
Quality	ETI 1110 Introduction to Quality ETI 1117 Introduction to Quality Control ETI 2110 Introduction to Quality Assurance
Manufacturing Processes	ETI 1411 Manufacturing Processes ETI 2411 Manufacturing Processes ETI 1420 Manufacturing Processes & Materials ETI 1420C Manufacturing Processes & Materials EST 1352 Introduction to Manufacturing Processes ETI 2622 Intro to Lean Manufacturing ETIC 1830 Materials & Processes
Measurement	ETI 1130C Instrumentation ETI 1152 Instrument Techniques and Measurement EST 1520 Basics of Instrumentation ETIC 2851 Applied Mechanics ETM 1010 Mechanical Measurement & Instrumentation ETM 1010C Mechanical Measurement & Instrumentation
Maintenance Awareness	Covered under other courses as noted

Online course materials for Engineering Technology classes may be found on the Engineering Technology (ET) WIKI: www.etshare.pbworks.com Registration is required to access the WIKI; simply visit the site, register and request a log-in from Daytona State College.

Safety: **Suggested Course Outcomes:**

In this course, students will encounter a comprehensive view of industrial processes and materials properties, employee activities, and facility operations leading to a safe and productive modern manufacturing workplace.

1. Identify safety policies and regulations, safety training, personal safety practices, and teamwork skills that enhance workplace safety and safe operator performance in a modern manufacturing environment.

FLDOE 01.0, 04.0, 08.0, 10.0, 11.0
MSSC WORK 1, 3, 5, 6
MSSC WORKER Safe and Productive Workplace, Personal Safety Practices, Safety Policies and Regulations, Safety Training, Communication Skills that Enhance Safety, Teamwork Skills that Enhance Safety

2. Describe methods used to train employees in safety procedures and practices, safe materials handling, responding to workplace hazards and emergencies, industrial hygiene, and environmental safety requirements.

FLDOE 01.0, 04.0, 08.0, 10.0, 11.0
MSSC WORK 1, 2, 3, 5, 6
MSSC WORKER Safe and Productive Workplace, Safety Procedures, Personal Safety Practices, Safety Policies and Regulations, Safety Training, Communication Skills that Enhance Safety, Teamwork Skills that Enhance Safety

3. Describe corrective action for unsafe workplace conditions.

FLDOE 06.0, 07.0, 08.0, 11.0
MSSC WORK 2, 3, 4, 8, 9
MSSC Worker Safety Procedures, Personal Safety Practices, Safety Policies and Regulations, Safety-related Maintenance Procedures, Safety Training, Training Skills that Enhance Safety

4. Describe manufacturing facility safety practices and procedures for safe materials and equipment handling (including electricity, fire, and hazardous materials).

FLDOE 01.0, 03.0, 04.0, 08.0, 10.0, 11.0
MSSC WORK 1, 2, 4, 7, 8, 9
MSSC Worker Safety Procedures, Personal Safety Practices, Safety Policies and Regulations, Safety-related Maintenance Procedures, Safety Training, Training Skills that Enhance Safety

5. Identify tools, instruments, testing devices and how they are used to monitor, troubleshoot, and maintain safe equipment and avoid potential workplace hazards.

FLDOE 06.0, 07.0, 08.0, 10.0, 11.0
MSSC WORK 1, 2, 4, 8, 9
MSSC Worker Safety Procedures, Personal Safety Practices, Safety Policies and Regulations, Safety-related Maintenance Procedures, Safety Training, Training Skills that Enhance Safety

6. ***Demonstrate use of skills using instruments and testing devices to monitor, maintain and evaluate safe equipment and operator performance.***

FLDOE 01.0, 03.0, 04.0, 06.0, 07.0, 08.0, 10.0, 11.0
MSSC WORK 1, 2, 3, 4, 5, 6, 7, 8, 9
MSSC Worker Safe and Productive Workplace, Safety Procedures, Personal Safety Practices, Safety Policies and Regulations, Safety-related Maintenance Procedures, Safety Training, Communication Skills that Enhance Safety, Teamwork Skills that Enhance Safety, Training Skills that Enhance Safety

7. Demonstrate basic troubleshooting skills in high performance, safety-conscious, modern manufacturing workplace scenarios dealing with hazardous materials, fire, and machine operations.

FLDOE 01.0, 03.0, 04.0, 06.0, 07.0, 08.0, 10.0, 11.0
MSSC WORK 1, 2, 3, 4, 5, 6, 7, 8, 9
MSSC Worker Safe and Productive Workplace, Safety Procedures, Personal Safety Practices, Safety Policies and Regulations, Safety-related Maintenance Procedures, Safety Training, Communication Skills that Enhance Safety, Teamwork Skills that Enhance Safety, Training Skills that Enhance Safety

Quality Practices & Measurement: Suggested Course Outcomes:

In this course, students will encounter the uses of quality assurance methods and quality control concepts and procedures which are standard operating business practices and strategies in a modern manufacturing environment. Test after both Quality and Measurement courses are completed.

1. Identify the methods and documentation used in internal inspections and quality audit procedures.

FLDOE 5.0, 08.0, 09.0, 10.0, 11.0
MSSC WORK 1, 4, 6, 8
MSSC WORKER Overall Quality Process, Quality Systems and Inspection Tools, Quality Documentation

2. Describe current trends in quality process outcomes.

FLDOE 5.0, 08.0, 09.0, 10.0, 11.0
MSSC WORK 1, 6, 8
MSSC WORKER Overall quality process, Quality Documentation

3. Suggest corrective actions based on the results of quality tests.

FLDOE 05.0, 06.0, 07.0, 09.0, 10.0, 11.0
MSSC WORK 5, 6, 7
MSSC WORKER Quality Systems and Inspection Tools, Corrective Action, Quality Documentation, Basic Measurement

4. Apply root cause analysis methodology.

FLDOE 01.0, 03.0, 04.0, 06.0, 07.0, 08.0, 09.0, 10.0, 11.0
MSSC WORK 2, 4
MSSC WORKER Overall Maintenance Process, Maintenance of Tools and Equipment, Maintenance-related Safety, Potential Maintenance Issues with Basic Production Systems

5. Describe the production scheduling principles and practices of Lean Manufacturing, High Performance Work Organizations, and Just-in-Time (JIT) Inventory Control. *This item was moved from Manufacturing Processes to Quality based on faculty feedback at ET Forum workshops.*

FLDOE 01.0, 04.0, 05.0, 07.0, 08.0, 09.0, 10.0, 11.0
MSSC WORK 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
MSSC WORKER Processes and Production, Production Equipment Operations, Production Materials, Tools and Equipment, Work Orders and Documentation

6. Describe preventive maintenance methods and applications.

FLDOE 01.0, 02.0, 03.0, 04.0, 05.0, 06.0, 07.0, 08.0, 09.0, 10.0, 11.0
MSSC WORK 1, 2, 3, 4
MSSC WORKER Overall Maintenance Process, Maintenance of Tools and Equipment, Documentation of Maintenance, Maintenance-related Safety, Potential Maintenance Issues with Basic Production Systems, Proper Lubrication Procedures, Bearings and Coupling Reliability, Belt and Chain Drive Reliability

Note: In 2010, FLATE collected data for students enrolled in college courses and taking the MSSC certification tests. For 17 students taking the MSSC Quality Assurance Test at two different colleges, only one passed the MSSC category: Document the results of quality tests, and only two passed the MSSC Category: Fundamentals of blueprint reading. No students in this group passed the MSSC Category: Use common measurement systems and precision measurement tools. Thus, an emphasis in these areas is indicated.

Manufacturing Processes & Production: Suggested Course Outcomes:

In this course, students will encounter manufacturing processes, production systems and techniques, mechanisms, materials and their properties which are used in a modern manufacturing environment.

1. Identify the functions and components of simple/compound machines and conveyor systems.

FLDOE 01.0, 03.0, 06.0, 10.0, 11.0
MSSC WORK 1, 2, 3
MSSC WORKER Overall Maintenance Process, Maintenance of Tools and Equipment, Potential Maintenance Issues with Basic Production Systems, Proper Lubrication Procedures, Bearing and Couplings Reliability, Belt and Chain Drive Reliability

2. Indentify appropriate machines, resources, equipment, and mechanisms used in manufacturing.

FLDOE 01.0, 04.0, 09.0, 10.0, 11.0
MSSC WORK 1, 2, 5, 6
MSSC WORKER Processes and Production, Production Equipment Operations, Production Materials, Tools and Equipment

3. Summarize the physical properties and characteristics of engineering materials necessary for efficient manufacture.

FLDOE 01.0, 04.0, 09.0, 10.0, 11.0
MSSC WORK 1, 2, 5, 6
MSSC WORKER Processes and Production, Production Equipment Operations, Production Materials, Tools and Equipment

4. Summarize the mechanical properties and characteristics of engineering materials.

FLDOE 01.0, 04.0, 09.0, 10.0, 11.0
MSSC WORK 1, 2, 5, 6
MSSC WORKER Processes and Production, Production Equipment Operations, Production Materials, Tools and Equipment

5. Select appropriate manufacturing processes, materials, and documentation in production scenarios.

FLDOE 01.0, 04.0, 05.0, 08.0, 09.0, 10.0, 11.0
MSSC WORK 7, 8, 9, 10
MSSC WORKER Processes and Production, Production Equipment Operations, Production Materials, Tools and Equipment, Work Orders and Documentation

6. Interpret diagrams, schematics, and industrial prints.

FLDOE 01.0, 02.0, 06.0, 07.0, 11.0
MSSC WORK 1
MSSC WORKER Documentation of Maintenance, Maintenance-related Safety

7. Identify types and uses of industrial lubricants.

FLDOE 01.0, 06.0, 07.0, 11.0
MSSC WORK 1, 2, 3, 4
MSSC WORKER Overall Maintenance Process, Maintenance of Tools and Equipment, Documentation of Maintenance, Maintenance-related Safety, Potential Maintenance Issues with Basic Production Systems, Proper Lubrication Procedures, Bearings and Coupling Reliability, Belt and Chain Drive Reliability

8. Identify proper functioning of bearings, couplings, belts, and chain drives.

FLDOE 01.0, 06.0, 07.0, 11.0
MSSC WORK 1, 2, 3, 4
MSSC WORKER Overall Maintenance Process, Maintenance of Tools and Equipment, Documentation of Maintenance, Maintenance-related Safety, Potential Maintenance Issues with Basic Production Systems, Proper Lubrication Procedures, Bearings and Coupling Reliability, Belt and Chain Drive Reliability

Suggested Course Outcomes to cover MSSC standards in *Maintenance Awareness*

It was determined by consensus at the Sept. 30, 2011 ET Forum MSSC course review workshop that *students will become aware of maintenance applications used in total productive maintenance concepts and procedures which are standard operating business practices and strategies in a modern manufacturing environment* as a part of other ET coursework. Identified courses where concepts are taught are indicated in red, a listing of core course NUM, PFX, and title by core course category is found on page 1.

Covered in Electronics courses

Use Ohm's Law and Power Law formulas to determine current, voltage, resistance and power. EET 1084

FLDOE 03.0, 04.0, 08.0, 10.0, 11.0

MSSC WORK 2, 4

MSSC WORKER Overall Maintenance Process, Maintenance-related Safety, Potential Maintenance Issues with Basic Production Systems

Covered in Instrumentation and Measurement courses.

Describe the housekeeping steps needed to maintain safe, efficient production schedules.

FLDOE 01.0, 04.0, 06.0, 08.0, 09.0, 10.0, 11.0

MSSC WORK 1, 2, 3

MSSC WORKER Overall Maintenance Process, Maintenance of Tools and Equipment, Documentation of Maintenance, Maintenance-related Safety

Covered in Measurement courses

Properly maintain tools and equipment through preventative maintenance and routine repair.

FLDOE 01.0, 04.0, 06.0, 08.0, 09.0, 10.0, 11.0

MSSC WORK 1, 2, 3

MSSC WORKER Overall Maintenance Process, Maintenance of Tools and Equipment, Documentation of Maintenance, Maintenance-related Safety

Covered in Manufacturing Processes courses

Interpret diagrams, schematics ,and industrial prints.

FLDOE 01.0, 02.0, 06.0, 07.0, 11.0

MSSC WORK 1

MSSC WORKER Documentation of Maintenance, Maintenance-related Safety

Covered in Quality courses

Describe preventive maintenance methods and applications.

FLDOE 01.0, 02.0, 03.0, 04.0, 05.0, 06.0, 07.0, 08.0, 09.0, 10.0, 11.0

MSSC WORK 1, 2, 3, 4

MSSC WORKER Overall Maintenance Process, Maintenance of Tools and Equipment, Documentation of Maintenance, Maintenance-related Safety, Potential Maintenance Issues with Basic Production Systems, Proper Lubrication Procedures, Bearings and Coupling Reliability, Belt and Chain Drive Reliability

Covered in Manufacturing Processes courses

Identify types and uses of lubricants.

FLDOE 01.0, 06.0, 07.0, 11.0

MSSC WORK 1, 2, 3, 4

MSSC WORKER Overall Maintenance Process, Maintenance of Tools and Equipment, Documentation of Maintenance, Maintenance-related Safety, Potential Maintenance Issues with Basic Production Systems, Proper Lubrication Procedures, Bearings and Coupling Reliability, Belt and Chain Drive Reliability

Covered in Manufacturing Processes courses

Identify proper functioning of bearings, couplings, belts, and chain drives

FLDOE 01.0, 06.0, 07.0, 11.0

MSSC WORK 1, 2, 3, 4

MSSC WORKER Overall Maintenance Process, Maintenance of Tools and Equipment, Documentation of Maintenance, Maintenance-related Safety, Potential Maintenance Issues with Basic Production Systems, Proper Lubrication Procedures, Bearings and Coupling Reliability, Belt and Chain Drive Reliability

Appendix

Other ET Core Courses

Electronics	EET 1083 Electronics Orientation EET 1084 Introduction to Electronics EET 1084C Introduction to Electronics EET 1184 Introduction to Electronics EET 2084C Introduction to Electronics
CAD	CGS 2470 Computer Aided Drafting & Design EGS 1110 Engineering Graphics EGS 1111 Engineering Graphics ETD 1320 Introduction to CAD ETD 1320C Introduction to AutoCAD ETD 1320C Computer Aided Drafting for Engineering ETDC 2320 AutoCAD Fundamentals ETD 2320C Computer-Aided Drafting

NEXT Advertorial Performance

The *Made in Florida* manufacturing advertorial in *Florida Trend's NEXT* magazine reaches hundreds of thousands of Florida high school students, informing them about careers in modern manufacturing, and providing the guidance to make the educational choices needed to obtain these careers. These advertorials trigger student interest in manufacturing as a viable and lucrative career pathway and promote the image that Florida's manufacturing industry provides challenging, state-of-the-art technology jobs with high wages.

Florida Trend's NEXT teen response program provides weekly electronic leads to FLATE with contact information for teens requesting school and/or career information. FLATE staff zip code match these leads and forward them to colleges and technical schools. In addition, students providing a valid email address receive an email from FLATE containing ready to use online collateral materials including: community college program maps, manufacturing career Job Journey (wage information), listings and links for Florida manufacturers, NEXT Advertorial, In-Demand magazine article on Robotics – Advanced Manufacturing, degree program fliers, *Made in Florida* website information, FLATE's social networking sites, help with Florida's student advising site FACTS.org, and an email address to contact FLATE for help and additional information. All leads received by FLATE (2,301 email and postal card requests for the 2010-11 advertorial) are forwarded monthly to 45 Florida colleges and technical schools.

2011 marks the sixth year that we have partnered to place content in *NEXT*, the career guidance issue of *Florida Trend*. Due to a reduction in funds from the Florida Dept. of Education, *Florida Trend* has reduced both the page count and distribution of their *NEXT* magazine, nevertheless, advertorials continue to provide an important opportunity for Florida's manufacturers to reach tomorrow's workforce and promote positive awareness of manufacturing careers and education. As well, the MAF editorial coordinated by FLATE increased its percentage of *NEXT* total lead responses to 8%.

Florida Trend's NEXT Magazine Distribution and Advertorial Performance

Date	Pages	Total *NEXT* Distribution	Total # of Student Responses Received Annually by *NEXT*	Total # of Student Responses Received from Mfg. Advertorial	Student Responses Received by FLATE as a % of *NEXT* Total
2006-07	100	750,000	580,319	4,360	8%
2007-08	104	750,000	803,989	4,698	6%
2008-09	96	750,000	805,461	5,762	7%
2009-10	76	400,000	417,829	2,831	7%
2010-11	70	400,000	250,789*	2,301	8%

*Responding to the -40% change in total student responses received, *Florida Trend* states, "The difference in the total number of leads for the issues is due to several factors, including the active links in the digital edition which allows the students to click on the ads and go directly to the advertiser websites to request information." Despite the decline, gender tracking FLATE added to the *NEXT* data collected beginning in 2009 continues to indicate that the advertorial is a very important outreach tool to inform high school girls about educational and career opportunities in Florida's high tech manufacturing industry.

2009-11 Gender Snapshot

Date of Advertorial	Total # of Student Responses Received from Mfg. Advertorial	Total Responses from Males	Total Responses from Females
2009-10	2,831	791 28%	2,034 72%
2010-11	2,031	533 26%	1,498 74%

For the 2009-10 advertorial, 60% of students requested information by filling out the response card found in the magazine rather than submitting their request online. For the 2010-11 advertorial, this figure increased to 76%. *NEXT*, in an effort to increase their significantly lower student response numbers and increase online student participation for their website and digital "flipbook" is using a "contest" format to replace the term "information request card" for students requesting information for the 2011-12 edition of *NEXT.* However, the consistent preference for postal response cards to request college and career information by students over the past two years emphasizes the importance of FLATE's role providing leads to Florida colleges and technical schools for followup.

Do Students Find the Advertorial Effective?

Surveys were sent to 1,842 *NEXT* provided email addresses to ask: *Was the information you received via email useful in helping you learn about high tech, high wage manufacturing careers in Florida and the education needed to obtain these careers, "yes" or "no"?* 33 students (2%) responded. Of these 33 responses, 26 students (79%) answered "yes" and 7 students (21%) answered "no." "No" responders will be contacted with a personal follow-up to determine what was lacking for them in order to better meet student needs.

FLATE initiatives with *NEXT* include:

- A 2010-11 pilot study to examine a model using current institutional outreach measures and NEXT data enrollment outcomes was concluded and presented to the Occupational and Workforce Education Commission at the 2011 Association of Florida Colleges (AFC) Joint Commissions Spring Conference.

- A research study based on the pilot to examine how all Florida colleges use FLATE's advertorial generated leads program to increase enrollment was concluded in Sept. 2011, and was presented planned for dissemination to Florida colleges and presentation at the 2012 Association of Florida Colleges (AFC) Joint Commissions 2011 Spring Conference.
- As previously noted, demographics analysis added to collection criteria in 2009 and reported in the 2010 and 2011 *NEXT* data performance report reflect significant interest by female high school students in careers and education in Advanced Manufacturing. A plan to develop outreach targeted toward high school girls was initiated at a FLATE 2011 summer focus group composed of county teachers, FLATE staff, and a female engineering student from the University of South Florida. Effort toward student engagement in this area will continue in 2012.

Florida Advanced Technological Education Center (FLATE) Evaluation Report
For Year Ending December 31, 2011
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 is centered on FLATE's operational goals with a section that includes other elements of performance in key areas. Part II includes effectiveness results measures relating, in three sections, to the three overall organizational effectiveness strategies: Curriculum Development and Reform, Outreach and Recruitment, and Professional Development, which speak directly to NSF's expectations for FLATE. Part III includes recommendations for improvement based on this evaluation.

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

Strengths:

- In each area, Curriculum Development and Reform, Outreach and Recruitment, and Professional Development, evaluation evidence shows that FLATE continues to make

progress in addressing and implementing its strategies. The use of FLATE-developed curriculum at community and state colleges continues to expand. The FLATE outreach activities have increased awareness among stakeholders, although there is further to go, regarding FLATE activities in establishing a climate conducive to promoting manufacturing workforce education, development, training, and career paths. Professional development activities have been targeted to educators and others to support and endorse manufacturing careers among current and potential manufacturing workforce members.

- Communication with, input from, and relationship building with Stakeholders, Staff, Volunteers, Customers, Partners is embedded into the culture and overall operation of FLATE and the Leadership Team. Stakeholder focus is rooted in the organizational culture.

- There's a focus on organizational sustainability. FLATE leadership has a clear vision for the future, and systematically seeks opportunities that align with sustainability options.

<u>Opportunities for Improvement, and Recommendations:</u>

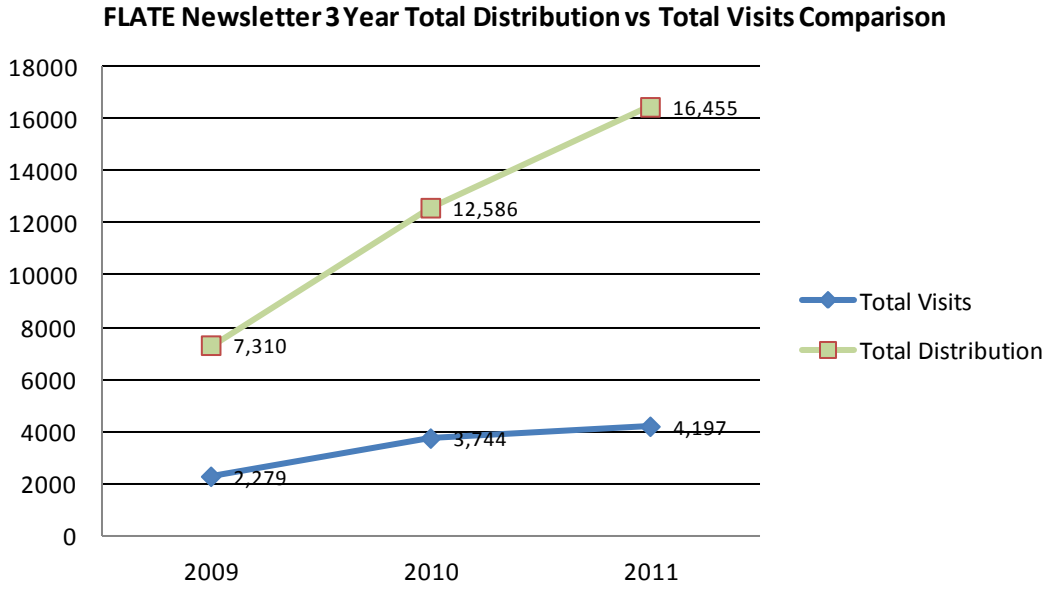
- Increased attention needs to be put to reverse the unfavorable trends in high school enrollments and completions in engineering technology and related programs, since these represent a significant pathway and pipeline to these programs.

- Outreach is a perennial opportunity and requires never-ending attention. Focus should continue on three aspects of outreach: outreach between FLATE and academia to increase awareness of FLATE's services and products; outreach between FLATE and industry to increase awareness of the workforce resources and sources of technical employees for manufacturers; networking connections between industry and academia.

- Efforts should be continued to establish useful and relevant sources of comparison performance data in key areas of importance.

FLATE Performance and Benchmark Research

FLATE FOCUS Newsletter performance data demonstrates a consistently positive upward trend over the three year tracking period.



Benchmark Study

In 2011, FLATE benchmarked with another ATE center with an online newsletter that has a significantly greater distribution than FLATE (15,000 vs 2,000). This greater distribution, however, does not translate into a similar difference in reader use measured by visits. FLATE intends to continue with this particular benchmark in 2012, collecting additional data, since the benchmarked ATE center, as a national NSF center with similar mission and stakeholder types, provides a NSF recognized model for FLATE.

Typical FLATE 2011 Monthly Distribution - 2,000
Typical Benchmarked ATE Center 2011 Monthly Distribution - 15,000
Benchmarked ATE Center 2011 Monthly Distribution less 12,000 community college employees - 3,000

The reasonable explanation for the difference is that 12,000 of the benchmarked center's distribution is to all community college employees, thus is distributed to a less targeted audience. However, when distribution of 12,000 is removed and benchmark distribution changed to 3,000vs FLATE 2,000, FLATE still performs favorably to the benchmark.

Reader Visit Snapshot (average of 2 months)
2011 FLATE Reader Visits with 2,000 distribution **Jan/Feb - 588**
FLATE User visit to distribution ratio: 29%
Benchmarked Center Data
2011 Other NSF ATE Center Reader Visits with 15,000 distribution **Jan/Feb - 719**
User visit to distribution ratio: 5%
2011 Other NSF ATE Center Reader Visits with 3,000 distribution **(12,000 college employees removed)** **Jan/Feb - 719**
User visit to distribution ratio with 12,000 college employees removed: 24%

FLATE Website Performance

FLATE home page performance data demonstrates a growth in usage.
Responding to stakeholder feedback, FLATE team webpage redesign of the *Made in Florida* website in 2010 resulted in a favorable increase in activity for 2011 and overall.

Annual Web Page Performance by Visit

	2009	2010	2011
FLATE Home Page	7,247	7,278	7,602
Made in Florida Home Page	10,885	7,303	8,755
Total Web Page Visits	18,132	14,581	16,357

Benchmark Study

FLATE Home Page	Average visitors to home page per month	634
Made in Florida Home Page	Average visitors to home page per month	730
Combined Avg. for 8 NSF-ATE Centers	Average visitors to home page per month	472
Evalu-ATE Center Home Page	Average visitors to home page per month	431

FLATE's associate director attended an online Evalu-ATE webinar for NSF grantees are using the Web for outreach, instruction, professional development, dissemination, and more. "As the Web becomes more central to the activities and deliverables of ATE grants, evaluation strategies need to keep pace. In this webinar featuring Karl Kapp, ATE evaluator and noted expert on e-learning, we'll share recent research … practices." http://evalu-ate.org/events/Nov11_webinar/
The experience was very valuable as it indicated that FLATE is already employing best practices in their website performance evaluation as well as provided a researched Evalu-ATE constructed, usable comparison benchmark.

*FLATE data is collected consistent with NSF Evalu-ATE Center's recommended method: using page visits via google analytics.

*Combined average for 8 ATE Centers was collected by Evaluate Center using 2011 page visits via google analytics.

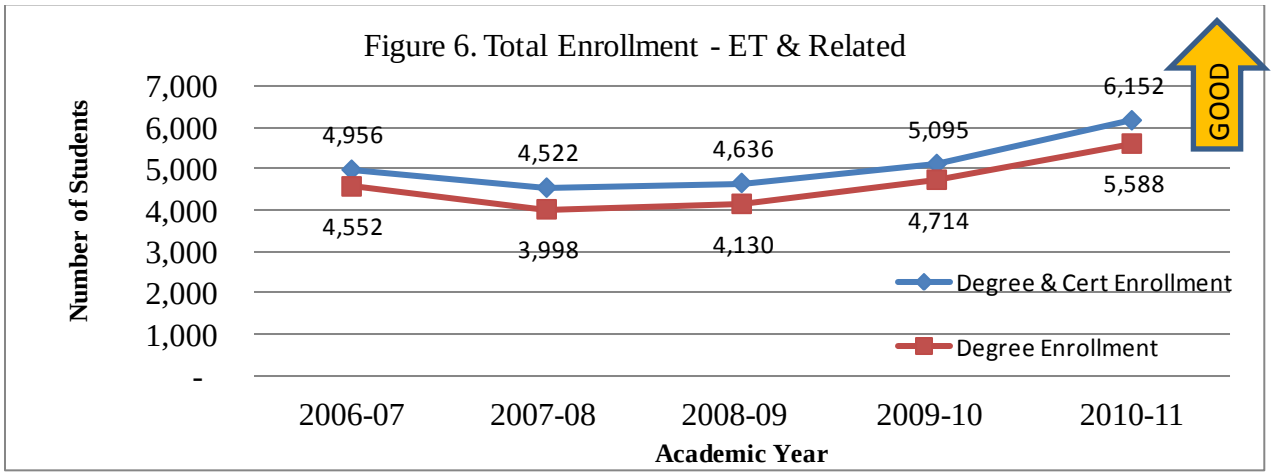
*The Evalu-ATE Center reports (Nov. 2011) that use of their site's home page has remained steady, with no significant growth or decline between 2010 and 2011; a finding similar to FLATE's page performance outcomes.

Engineering Technology Degree Program Enrollment Performance Benchmark

For an enrollment benchmark, and at the urging of FLATE's external evaluator, FLATE contacted an ATE Center in Connecticut which has a similar program to FLATE's Engineering Technology (ET) Degree program. Their Tech studies program is similar to the ET degree but has more science and less technology. In this excerpt from FLATE's 2011 Annual External Evaluation Report, the research demonstrates that although enrollment is higher in the compared program, the percent change for FLATE's program over the past year is appreciably higher and displays a rebounding positive enrollment trend.

Figure 5. ET Degree Enrollment & Related Technology Enrollment						
Program	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**
Overall ET Degree Enrollment	Non-Existent			145	347	603
Total Degree Enrollment - ET & Related	5147	4552	3998	4130	4714	5588
Percent Change Year over Year		-12%	12%	3%	14%	18.5%
Total Enrollment ET Degree & Related Degree & Certificate Programs	5398	4956	4522	4636	5095	6152
Percent Change Year over Year		-8%	-9%	3%	10%	21%
Comparative Program (Connecticut) Enrollment	625	665	797	978	1201	1275
Comparative Program Enrollment Percent Change Year over Year		6%	20%	23%	23%	6%

"Since the FLATE ET Degree program was implemented in three colleges in the 2007-2008 school year, a previously unfavorable decline in enrollments in engineering technology-related programs has been reversed. Direct enrollments in the ET Degree program statewide have increased from non-existent to 603 students in the 2010-2011 school year. Overall enrollments in related degree programs and including related certificate programs have favorably increased 21% year over year in the 2010-11 academic year. Figure 6. visually depicts the favorable trend since 2007 in Total Enrollment—ET Degree & Related Degree & Certificate Programs." FLATE's 2011 Annual External Evaluation Report, pg. 7-10)



FLATE's ToothPick Factory©: A Simulation Game for Soft Skills

The Toothpick Factory© online resource at http://madeinflorida.org/toothpick-factory/ is a popular destination on the Made in Florida website, receiving interest inquiries from as far away as Australia! This hands-on activity set in a manufacturing context stimulates discussion and awareness about a wide range of soft skills that are essential in today's work and personal relationships.

FLATE exceeded its goal to offer five additional Toothpick Factory ® workshops (FLATE goal 4.2). Expanded offerings at FLATE's professional development workshops for K-12 teachers and continued, consistent professional development offerings in local, statewide, and national venues and conference workshops including high profile events such as Hi-TEC and NCPN, have resulted in a measure of sustainability for the Toothpick Factory®, which will continue to be offered at conferences and workshops, and is available for purchase online on FLATE's Made in Florida website. Workshops may also be requested from FLATE on a just-in-time basis.

Toothpick Factory Presentations

Year	Number of Workshops	Participants
2006	1	15
2007	2	26
2008	3	62
2009	3	33
2010	7	232
2011	3	134
Total	19	502

In addition, another 45 satisfied participants were reported by purchasers of the Toothpick Factory®.

All Toothpick Factory® workshop participants are surveyed, and 96% agreed or strongly agreed "This is a resourceful way to promote the importance of soft skills."

Random samples of Toothpick Factory survey data collected from K-12 teachers: "What did you find most valuable?" [about the Toothpick Factory workshop] this year included:

* I would use this activity with my class and it is cross curriculum [for STEM].
* This game involves everyone and it shows the importance of teamwork.
* Learning how best to work within team and across production lines. Nice practice to uncover life skill development areas among peers.
* The ability to work in groups, very hands-on
* The job roles, the need to work together and the switching of roles
* Highly engaging + cross curriculum [for STEM]

2011 FLATE Stakeholder Survey

Participation & Results Summary

Survey Statement #	% Strongly Agree		% Agree		% Disagree		% Strongly Disagree		% Not Applicable		% Not Familiar	The # of People familiar with FLATE but returned no responses to Statements 2 through 7
	These percentages below are of the total respondents who answered the question											
	2009	2011	2009	2011	2009	2011	2009	2011	2009	2011	2011 only	2011 only
2. I have easy access to FLATE's staff and its products.	49	41	42	50	1	1	1	0	6	8	N/A	25 people
3. Direct support from FLATE's staff has assisted me in my work.	37	30	27	36	6	1	4	3	25	22	8	24 people
4. Professional Development initiatives provided by FLATE have assisted me in my work.	25	29	28	30	9	5	4	0	33	30	7	24 people
5. Curriculum Reform initiatives provided by FLATE have assisted me.	29	24	30	33	9	4	4	0	27	29	10	28 people
6. Curriculum Materials provided by FLATE have assisted me.	18	24	38	40	11	5	4	0	29	21	9	27 people
7. FLATE's "Made in Florida" outreach campaign created by FLATE has assisted me.	27	19	35	38	9	3	1	1	27	30	10	25 people

Participation:

About 1265 valid survey response requests were emailed to FLATE stakeholders. While it was hoped for more participation, we received 194 responses, a response rate of about 15%. Of the responses received, 17% are K-12 Educators/Administrators, 53% are Post-Secondary Educators/Administrators, 20% are Business/Industry representatives, 5% are Workforce and Economic Development Professionals, 2% represent Florida Department of Education and Government, and 4% includes Educational Suppliers and Vendors. Of the total, 57.7% of respondents are located in the State of Florida.

Responses:

The comparison summary response data below reflect overall responses, not by individual demographic groups (i.e. K-12 Educators/Administrators, Post-Secondary Educators/Administrators, Business/Industry, Economic & Workforce Development, Florida Department of Education/Government, and Educational Suppliers & Vendors).
Notes regarding numerical data:

- "Not Familiar" is a possible response that was **NOT** included in the 2009 survey. It is included in 2011 in an attempt to distinguish between clearly not applicable responses and potential opportunity to familiarize respondents with services and products that may actually be applicable.

- While clear trends cannot be discerned from data in only two surveys, 2009 and 2011, the following indications are apparent:

    - The **SUM** of "% Strongly Agree" and "% Agree" responses has increased since 2009 for every Survey Statement except 5 and 7. The "% Agree" responses have increased for every statement since the 2009 survey, while the "% Strongly Agree" responses have increased for Statements 4 & 6 and decreased for Statements 2, 3, 5, & 7.

    - The "Not Applicable" response has decreased for every Statement since 2009. This might be attributable to the alternative "Not Familiar" response option available in 2011.

    - Fifteen people acknowledged they are not familiar with FLATE and subsequently did not respond to any of the seven Survey Statements.

    - The rightmost column above shows the number of people who said they **ARE** familiar with FLATE and yet did not respond to each of the Survey Statements 2 through 7. Twenty-four people did not respond to any Statement.

    - "% Strongly Disagree" and "% Disagree" responses for each Statement are the same or fewer in 2011 than they were in 2009.

Recommendations Summary:

- There is demand for more and more frequent and more accessible professional development opportunities for educators (e.g. ET- and STEM-related workshops, Summer Institute).

- There continues to be a need for more outreach (with emphasis in South Florida) especially related to promoting exchange of ideas and greater cooperation between industry, academia, students, and collaboration with other organizations with similar missions.

- Maintain a focus on manufacturers, and technical education, to help them understand what resources are available to them and what benefits can be derived by understanding and cooperation with FLATE efforts to build the pipeline for and enhance the manufacturing workforce.

FLATE Scale Up Using the FLATE Contact List

According to the NSF-ATE Synergy Collaboratory (June 2011 Report), an important objective of NSF-ATE Center scale up activity includes "expanding a clientele or number of students served, increasing the reach of a project so that additional business, colleges, or communities are involved." Using the Synergy definition, it is apparent from the data that FLATE has demonstrated scale up in all areas within our realm of contact. These data are gleaned from our contact list, a single point of reference developed by FLATE which is used for FLATE dissemination of information about FLATE, its activities and impact, FOCUS Newsletter, advanced manufacturing news including the needs and opportunities of employers in the advanced manufacturing industry, college and industry partners and their activities, outreach, professional development opportunities, and promotion of online curriculum and services. This names but a few of the uses of this important tool which, due to FLATE's successful scale up activity, has expanded the scope of its impact.

		Jun-10	Jun-11	11-Dec
I	* Industry	317	377	413
W	* Workforce Dev, Training & Vendors	82	86	111
S	* Secondary Education	242	304	707
P	* Post Secondary Education	411	620	1,091
M	* Manuf & Prof. Associations	27	33	36
E	* EcoDev, Govt. & Community Org	54	69	229
F	FLATE	25	23	22
pp	* personal interest via email (mab)	1	1	2
		1159	1513	2611