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Report	Content					
Cover	Accomplishments	Products	Participants/ Organizations	Impact	Changes/ Problems	Special Requirements
Cover						
Federal / Which R	Agency and Organizatio eport is Submitted:	n Element to	4900			
Federal Assigned	Grant or Other Identifyin d by Agency:	g Number	1204751			
Project 1	Title:		FLATE: F Technolo Center o	Florida's Ac ogical Educ f Excellenc	dvanced ation e	
PD/PI Na	ame:		Marilyn E Investiga Richard J Principal	Barger, Prin ator A Gilbert, C I Investigate	icipal :o- or	
Recipien	t Organization:		Hillsbord College	ough Comm	nunity	
Project/0	Grant Period:		10/01/201	12 - 12/31/2	019	





Award DUE 1204751 - Annual Project Report Final report approved by V. Celeste Carter on Sept 21, 2018 Reporting Period: 10/01/2017 - 09/30/2018

FLATE

Florida Advanced Technological Education Center A National Science Foundation Center of Excellence

Dr. Marilyn Barger, Executive Director, PI Dr. Richard Gilbert, Co-PI



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NSF Award 1204751 - Annual Project Report

Accomplishments What was done? What was learned?

What are the major goals of the project?

Goal 1: To ensure that FLATE's mission is sustained.

Goal 2: 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.

Goal 3: To provide an effective outreach platform for Florida's high school, community college, industry, and legislative access to information related to the requirements for, and impact of, manufacturing education.

Goal 4: 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.

What was accomplished under these goals

Major Activities

With the end of the grant award approaching, FLATE leadership and staff have focused on mission sustainability and continuous improvement of activities and processes. FLATE has segmented and prioritized its missions and functions to target specific partnerships capable and willing to assume designated functions, beyond the life of the Center. To ensure that FLATE's mission is sustained, FLATE had updated a sustainability plan matrix with key functions and elements which should be sustained beyond the life of the NSF-ATE award. The sustainability plan includes specific target programs, potential partners willing and able to integrate FLATE's functions into their own organizations, partner roles, progress, and details of the program. A number of those partners have already begun this process. FloridaMakes, a FLATE partner, will play a key role in providing sustainability to a number of FLATE functions by becoming the host organization for the NSF-ATE center's mission in 2018. The transition will ensure that previous investment by NSF-ATE in the center continues to have a positive impact on the manufacturing and education community in Florida for the long-term. *FLATE Sustainability work plan* is provided as an attachment to this section.





Specific Objectives:

FLATE's goals and specific supporting objectives are the foundation of FLATE strategies for operational performance success. Each of FLATE's goals, along with their supporting objectives and effectiveness, is measured against the Florida model defined by the Baldrige/Sterling Criteria for Performance Excellence. Supporting files include *FLATE Sustainability work plan*, 2017-18 FLATE Community of Practice, 2016-17 FL Engineering Technology (ET) and related programs student enrolment, 2017 Post Visit MFG Day Survey Results Cumulative Report.

Significant results

Sustainability/Curriculum Reform and Development

FLATE continues the improvement of manufacturing education in Florida by facilitating a statewide approach to curriculum implementation with a statewide-unified education system for manufacturing. FLATE, working with the Florida Department of Education's (FLDOE) Career and Technical Education team, Florida colleges, and Florida industries constantly reviews and reform AS degree program in Engineering Technology (ET). Currently the program offers 11 specialization tracks and 20 technical college certificates, and 20 FLDOE frameworks. Frameworks are reviewed on a regular basis (legislatively mandated every three years) to maintain strong alignment to industry jobs and demands. FLATE is making plans for the next review to be started in Fall 2018.

In 2007, 3 colleges offered the AS degree program in Engineering Technology (ET). Thanks to FLATE's mentorship and support, today 23 of Florida's 25 state and community colleges with manufacturing-related programs have adopted and implemented the AS ET Degree program. During this year, 4 new colleges have adopted the program; Florida Southwestern State College, North Florida Community College, South Florida State College, St. John River State College. FLATE continues to mentor the ET Degree model to other related programs both in and outside of Florida. The 2016-2017 Enrollment and completions report, prepared by FLATE with data provided by FLDOE, indicates a continued favorable trend and growing enrollment for the AS ET Degree program has grown to 47%. Favorable growth in AS ET Degree programs proves sustainability of a statewide-unified education system/curriculum reform and development for manufacturing education.

Partnership projects with the Manufacturing Skills Standards Council (MSSC) showing a continuous increase of credentials in Florida. 449 additional MSSC Certified Production Technicians (CPT) were added to bring the cumulative total to 14,062 since its introduction in 2006. The MSSC CPT certification, currently the only certification that carries Florida's Gold Standard originated and promoted by FLATE, is an incentive for students in the AS ET degree program as the credentail articulates as 15 college credit hours towards the degree. Overall industry certifications such MSSC CPT, National Institute for metalworking Skills (NIMS), and American Welding Society (AWS) have continued to increase in Florida. These certifications are aligned to the FLDOE curriculum frameworks at the secondary, post-secondary vocational, and college levels. As an example, the numbers of the NIMS credential certifications





have grown significantly from 499 in 2016 to 1,049 in 2017. The continuous increase in the number of certifications in Florida also demonstrates the sustainability of a statewide-unified education system/curriculum reform to strengthen industry relationships and build effective pipelines that support Florida's manufacturing workforce needs.

FLATE's partnership with CORD and ET Degree educators in CORD's Necessary Skills Now grant, developed learning modules that integrate employability skills in manufacturing. The project developed and ran 4 workshops to share the resources and train educators. FLATE was also a partner in the Collaboroative Centers for Tecchnical Assistance (CCTA) and produced two annual topical webinars. Recordings and files of all webinars are posted online at atecenters.org/ccta.

PathTech LIFE is a collaboration led by the University of South Florida (USF) and FLATE. The purpose of this national survey is to understand how learning, interests, family, and employment (LIFE) experiences of two-year college students impact their decisions to enroll, return for further coursework, and/or pursue a certificate or degree. Pilot results (2017) of the 528 students from 26 different colleges that responded to the survey indicated that most students were between the ages of 18 and 30 years old, with 84% of respondent identifying as male. Demographic data also revealed that 63% identified as white. Employment information showed that only 34% of students employed full time had jobs in their field of study while 48% of part time students have positions in ET. 71% had an AS as their goal with 55% of all respondents having a long-term goal of a bachelor's degree and to stay in the ET field. As of June 2018, with the colaboration of 7 ATE centers, the 3rd round of national surveys have been distributed to 96 colleges and 1443 participants. Results will be included in the next report.

Sustainability/Outreach

FLATE's Made in Florida (MIF) products and events empower partners and stakeholders throughout Florida and across the nation. FLATE provides the information needed to plan, execute, and evaluate industry tours, summer robotics and STEM/ET camps, and outreach events. In 2017, FLATE's MIF outreach program included nearly 300 tours to 130 high-tech, manufacturing facilities in Florida for over 8,900 students, and 1,400 educators and parents. MIF Manufacturing day (MFG) and Month activities continues being one of the most effective and efficient outreach strategies to engage students in first-hand exposures and experiences in modern manufacturing, that would help them consider manufacturing as a career path. To ensure the sustainability of this extraordinary outreach campaign, FLATE partners with FloridaMakes, the Manufacturing Alliance of Hillsborough County, Regional Manufacturers Associations (RMAs) across Florida, statewide industry partners/manufacturers, school districts/educational partners, workforce and economic development, other stakeholders, and the community. Evidence of partners' contributions and sustainability of MFG Day and Month is supported by their contributions. Cash contributions increased from \$12,781 in 2016 to \$31,462 in 2017 and





In-Kind contributions increased from \$281,899 in 2016 to \$863,134 in 2017. FLATE-developed resources including videos, graphics, lessons, and guides for MFG student tours, these resources are available on flate.pbwiki.com. Data collected includes anecdotal evidence; specific feedback after the tours has been collated from surveys, industry hosts, staff, and teachers as well as aggregated survey results from eight years of MFG Day student tours. For more information see 2017 Post Visit MFG Day Survey Results Cumulative Report in the attachment.

The ET Forum is an important professional development and outreach vehicle to promote sharing and collaborating among the diverse and geographically dispersed colleges. It keeps educators connected with its semi-annual meetings. FLATE also continues working with partners, such as the DEAF-Tec Center and the AbleTrust, to increase opportunities for special needs students.

Sustainability/Professional Development.

FLATE has increased its ongoing Professional Development (PD) for Florida CTE educators about manufacturing careers, educational pathways, specific technologies, and new pedagogy by strengthening partnerships with the Florida Association for Career and Technical Education (FACTE), and the Florida Association for Industrial and Technical Educator (FAITE), a division of FACTE. FLATE's PD events are explained in the "*Opportunities for training and professional development*" session below.

Key outcomes or Other achievements

As part of sustainability plan, FLATE continues the transition of FLATE's statewide annual coordination role for Made in Florida (MIF) Manufacturing day (MFG) and Month campaign into FloridaMakes to assure focus is maintained post-FLATE. A Memorandum of Understanding (MOU) with FloridaMakes was executed in 2017. However, events are still being coordinated outside of FloridaMakes by regional groups alone with FLATE still collecting, aggregating survey data and reporting these numbers back to the regions. FLATE has implemented an option for online surveys to decrease the work related to data collection. FLATE is emphasizing the use of this online survey and hopes to increase its use.

This survey is a very important tool to evaluate the impact of this statewide campaign. Surveys are distributed to industry hosts, educators, and students who participate in Florida MFG Day/Month industry tours. FLATE continues with the design, management, and processing of all MFG Day/Month post survey. FLATE also designs materials and resources to promote MFG Day/Month events. Resources such as shirts, posters, buttons, MFG Day/Month publications, press kit that regional partners can use as part of their media relations/outreach strategy, and many more resources are available on the FLATE wiki.





Made in Florida MFG Day/Month is the primary vehicle for FLATE outreach to students, industry partners, and community and continues growing strong around Florida. FLATE together with its network of statewide industry partners, FloridaMakes, RMA's, and schools worked cohesively to coordinate MIF MFG Day/Month industry tours and events across the state.

Hurricane Irma and other tropical storms affected 2017 MFG Day/moth events, some industry tours were postponed to spring 2018. Despite this adverse weather, results from the MFG Day/ Month industry tours post surveys, revealed exciting numbers demonstrating sustainability and great impact in Florida. 5,070 students, 120 parents and chaperons, 359 educators, 149 schools, 569 manufacturing employees, across Florida participated in approximate 293 Made in Florida MFG Day/Moth industry tours to 123 high-tech industry sites. Five virtual tours, a new modality for this year, were included as part of this extraordinary campaign. Summary *2017 Post Visit MFG Day Survey Results Cumulative Report* can be found in the attachment.

Eighty-eight industries from across Florida used an additional online survey to review curriculum content of Florida schools preparing competent workforce to meet manufacturers' technician workforce needs. This survey was developed by FloridaMakes in partnership with Polk State College (PSC), the Engineering Technology (ET) Forum and FLATE. Eighty-eight respondents from across Florida completed the survey. The *Industry Engineering Technology Competencies Survey Results Report* can be found as an attachment in the products session.

FLATE's 2018 Summer Camps, another successful year promoting Robotics, STEM & manufacturing education in Florida. Every summer a number of schools and organizations partner with FLATE to offer fun and motivating camps to middle and high school students across Florida. Camps were held at Hillsborough Community College (HCC) in Tampa; Lake Sumter State College; North Florida Community College, IHMC in Pensacola and Ocala facilities; and Frank H. Peterson Academies of Technology in Jacksonville. Robotic Summer Camps were modeled after FLATE's summer camps, used FLATE curriculum, and served as a mechanism to reach out to a broader range of students across the state.

The camps also proved to be a sustainable and effective mechanism to get middle and high school aged students from all socio-economic backgrounds interested in STEM and robotics education and related career pathways. In addition, FLATE transistioned the camps at HCC to the college ET Department and together they offered 4 camps with over 100 middle and high school students. During the 5-day camps, students programmed and built LEGO® Mindstorms® EV3 Robot systems, participated in team challenges and learned how STEM are used in today's high-tech industries.

The FLATE awards, now presented during the Florida Association for Career and Technical Education (FACTE) Annual Conference and co-hosted by FLATE and FAITE (a division of FACTE), proved to be a beneficial strategy providing more exposure, networking and an





additional level of recognition for the winners as well as more ownership by the community it benefits.

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. Florida Career Pathways Best Practice-FCPN Award was presented to FLATE at their Annual symposium, Career Pathways on January, 2018 in Jupiter Beach, FL. This award recognizes participants for outstanding dedication and leadership in support of Florida's Career Pathways Initiatives demonstrated through Florida Best Practices: "Robotics: A Tool for Integrating STEM Disciplines" and "Factors Affecting Engineering Technology Pathways-Sharing real students perspectives to help increase recruitment and retention in your program". Other achievements include FLATE publications and Project Highlights. FLATE Annual Project Highlights provide key outcomes and achievements for all FLATE areas. All available at http://fl-ate.org/programs

What opportunities for training and professional development has the project provided?

Partnership with the Florida Association for Career and Technical Education (FACTE), the Florida Association for Industrial and Technical Educator (FAITE), and the Able Trust HSHT program continue to strengthen. These partnerships have increased the opportunity to prove sustainabiliy providing professional development (PD) opportunities for the Florida educators and program coordinators about careers and educational pathways in manufacturing. PD events include multi-day workshops, presentations, online webinars at hundreds of events in Florida and nationally. Important to mention in 2017 are the ET Summer Institute on Robotics (AMSIR) cosponsored by FACTE, Lego Mind Storms workshops, Introductory and Intermediate FLATE Summer Camp for Teachers, and presentations at the Annual FACTE conference.

The ET Forum is an essential vehicle to bring together the diverse and geographically dispersed colleges with common issues and challenges. The Forum is a semiannual 2-day meeting of community college ET technologies faculty in Florida. FLATE utilizes the Forum to strengthen its Technology Consortium; share its activities and projects; provide PD; bring industry and academics together. The ET Forum has met forty times since 1996.

FLATE continued strengthening PD partnerships with other nationwide recognized organizations including the USF Stavros Center, Florida Career Pathway Network (FCPN), the National Career Pathway Network (NCPN), SkillsUSA-FL, educational equipment vendors, and a number of conferences such as HITEC. In addition, FLATE continued working with partners, such as the DEAF-Tec Center and the AbleTrust, to increase opportunities for special needs students. FLATE maintained PD curriculum and resources current by monitoring trends in education and industry needs, through close association and feedback from industry partners, through informal and formal focus group sessions at meetings. Number of PD hrs increased from 6,678 hrs in 2016 to 9,089 hrs in 2017 to 2,999 educators in 2016 and 3,268 educators and counselors (K-14) in 2017. Numbers of industry workforce, manufacturing personnel have also increased from 1,003 in 2016 to 2,280 in 2017.





FLATE collaborated with the Manufacturing Skills Standards Council (MSSC) for faculty professional development. A long-term goal is to increase the Florida high school students' CPT assessments passing rate to 80%. In 2017 eleven high school educators were enrolled in a FLATE – facilitated training course for the CPT and passed the credential examinations. FLATE, in partnership with the Centers Collaborative for Technical Assistance (CCTA), created a web portal project to provide coaching on programs and consortium issues, in-person convening, webinars support, and peer-to-peer learning.

Another important nation-wide opportunity for training and PD, developed and supported by FLATE, is the monthly Mechatronics Community Exchange (MCE) meetings. Specific work with the PowerAmerica institute includes PD for ATE center educator-stakeholders related to the wide band gap technologies and applications and; ongoing communication that will seed a strong working relationship focused on more PD opportunities. This specific project effort has fostered working interactions with several other Manufacturing USA institutes including Advanced Functional Fabrics of America (AFFOA), Advanced Robotics Manufacturing (ARM), and NextFlex.

Finally, FLATE continues to mentor secondary and post-secondary institutions. These NSF-ATE mentoring efforts have increased FLATE's opportunity for mission sustainability. They also provide ongoing PD for the Florida educators and program coordinators regarding careers and educational pathways in manufacturing.

How have the results been disseminated to communities of interest?

FLATE continues to disseminate its knowledge and results by presenting in several conferences and workshops locally and around the nation, using constant online publications and social media postings. FLATE's homepage, Made in Florida, FLATE's online wiki resource for educators, and The FLATE FOCUS online newsletter continues being a very important dissemination platform for FLATE. These online sites provide free information, news and multiple educational resources to serve teachers, faculty, industry, students and community at all levels and locations.

FLATE's homepage <u>www.fl-ate.org</u> provides information and resources about FLATE's mission, projects, committees, partners, ET education, sTEm-at-work puzzles, accolades and awards, events, activities news and events, FLATE publications, FLATE's work with industry certifications and college frameworks, FLATE Best Practice Guides, Professional Development opportunities, plus other relevant resource links combine to give site visitors a comprehensive and reliable source of information. FLATE's homepage had 15,344 visits recorded in 2017.

FLATE's Made in Florida website <u>http://madeinflorida.org/</u> offers a unique dissemination source by providing a one stop shop connecting technical educators, industry partners, students, and other interested parties to FLATE's signature "*Made in Florida*" services and products. The Made in Florida home page visits has grown from 23,010 in 2016 to 27,019 visits in 2017.





The *FLATE FOCUS* **online blog format newsletter** generated over 4,560 sessions from 3,395 users, 17,246 total page views, average of 3.78 page views per session. Distributed and reviewed in US and 97 countries; some of the countries are India, France, Canada, South Korea, Philippines, United Kingdom, Australia, Peru, South Africa, Spain, Nigeria, Greece, and Germany.

FLATE's online wiki resource for educators <u>http://flate.pbworks.com/</u> offers professional development, recruiting and career pathways' resources, as well resources for curriculum to support STEM, advanced technical education, industry tours, summer camps, resources supporting recruiting girls for STEM, and FLATE's presentation content from conferences and events. These resources provide a significant set of over 380 free, online and print-ready resources supporting sTEm education focused on technology and engineering.

FLATE's leadership with ATE Joint Display exhibits helped FLATE, along with other NSF-ATE Centers, provide dissemination and a highly visible, coherent NSF program impact to a variety of stakeholders at conference venues throughout the year.

What do you plan to do during the next reporting period to accomplish the goals?

As FLATE sunsets and the end of the grant award approaching, FLATE leadership and staff will continue its focus on mission sustainability and continuous improvement of activities and processes. For this effort, FLATE constantly updates and use the sustainability matrix for prioritizing and describing potential opportunities. FLATE will continue strengthening existing partnerships and opening opportunities for new geographically diverse stakeholders, customers, and partners capable and willing to assume designated functions, beyond the life of the Center. FLATE will continue focusing on recruitment of female and minority participants into manufacturing education programs.

FLATE will also focus on completing the objectives of its supplemental funding awarded in early summer 2018. Goal (A) Conduct a set of workshops to build a statewide Community of Practice of 2-year degree faculty and regional associations that also focus their resources in support of advanced manufacturing in Florida. Goal (B) Create professional development activities for faculty to provide students the mechatronics-based knowledge and skills manufacturers' require of technicians that support controlled manufacturing environments.





Products - What has the project produced?

Juried Conference Paper

Published. Barger, M., & Gilbert, R. New Mechatronics Education Initiatives. (2018, June). 2018 ASEE Annual Conference & Exposition. peer.asee.org/30839. Publication Identifier Type (other). Acknowledgement of Federal Support (yes). Peer reviewed.

Published. Barger, M. FLATE's MSSC Workshop Highlights the New CPT+ Credentials. National Coalition of Advanced technology Centers (NCATC)-American Association of Community Colleges (AACC). Newsletter, volume 19, Issue No. 3, 3rd Quarter, 2018, page number 3, publication identifier http://files.constantcontact.com/71528589001/ab2a213f-1b15-43e4-bd1d-59f91ced3a0d.pdf. Acknowledgement of Federal Support (yes). No Peer reviewed.

Other Conference Presentation/paper

Published. Growth of 2-Year programs for Mechatronics. 2018 ASEE Southeastern Section Conference. Daytona, Florida, Conference. Barger, M., Gilbert, R. Acknowledgement of Federal Support (yes).

Published. PathTech LIFE (Learning, Interest, Family and Employment): Understanding Advanced Technology Students. 2018 ASEE Southeastern Section Conference. 2018. Barger, D., Orozco, D., Jayaram, L., Tyson, W. Acknowledgement of Federal Support (yes).

Other Products

• Data and Research material

Industry Engineering Technology Competencies Survey Results Report. This material includes de survey responses from manufacturers in Florida to help define curriculum content of schools preparing competent workforce to meet manufacturers' technician workforce needs. Eighty-eight respondents from across Florida completed the survey during two weeks period. This material have been shared via conference, workshops, forums, and it has been posted on line at http://flate.pbworks.com/w/file/fetch/126179081/Industry%20ET%20Competencies%20Survey%20Results%20Report%20041718.pdf

PathTechLIFE, Understanding pathways in advanced technologies, Florida Colleges findings report. The purpose of this first report is to determine how student pathways, career goals, and school-work-life balance influence program recruitment and retention in Florida.

The findings in this report reflect the students who participated in the PathTechLIFE Survey in spring 2017 at five Florida colleges. This is a Florida State report and only includes findings from the first wave of survey. This material has been shared via conference, workshops, forums, and it has been posted on line at

http://flate.pbworks.com/w/file/120009648/2017%20PathTech%20LIFE%20FL%20Report%20.pdf.





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PathTechLIFE, Understanding pathways in advanced technologies, nationwide findings report. This survey has been conceived in Partnership between University of South Florida, Florida Advanced Technological Education Center (FLATE) at Hillsborough Community College and national ATE Center Partners. The survey seeks to understand how learning, interests, family, and employment (LIFE) experiences of two-year college students affects their decisions to enroll, return for further coursework, and/or pursue a certificate or degree in advanced technology fields. This is the first wave of nationwide findings from spring 2017 with responses from 14 nationwide colleges. This material has been shared via conference, workshops, forums, and it has been posted on line at

http://flate.pbworks.com/w/file/120009654/2017%20PathTech%20LIFE%20Naionwide%20Rep ort.pdf.

• Evaluation - Survey Instruments

FLATE-University of South Florida. *PathTech LIFE (Learning, Interests, Family, and Employment) National Survey* (NSF #1501999). The University of South Florida's Department of Sociology and College of Education and the FLATE developed a national survey of individuals completing coursework, certification, and AS/AAS degrees in advanced technologies at community colleges. The purpose of this ongoing national survey is to determine how student pathways, career goals, and school-work-life balance influence program recruitment and retention.

Technician Competencies Survey

FloridaMakes developed the survey in partnership with Polk State College (PSC), the Florida Forum for Engineering Technology (ET Forum), and FLATE (Florida Advanced Technological Education Center of Excellence). The survey defines curriculum content of schools preparing a competent workforce to meet manufacturer's technician workforce needs. Posted at http://flate.pbworks.com/w/file/fetch/126179168/2017%200929%20SurveyMonkey_AlignFloridaadvyMfgTech.pdf.

• Audio or Video Products

2017 FLATE Impact and Highlights" video. (2017, August 11). https://www.youtube.com/watch?v=1NPKfVVcxBg&feature=youtu.be

Video shows the impact and highlights of what FLATE has been doing for manufacturing education in Florida. FLATE has worked tirelessly with the National Science Foundation, the Florida Department of Education, Career Source Florida, Florida School Districts, and Florida's community colleges to connect manufacturing and education to prepare students for high pay technical careers.

Best Practice Booklets for manufacturing outreach and professional development in several downloadable resource booklets. Available online in a Flip Book format and in PDF format.





Curriculum alignment to Credential (new), Professional development (new), FLATE Communications Programs (updated), Robotics Camps Survival Guide (updated), Project Highlights (updated). <u>http://fl-ate.org/best-practices/</u>.

• Ongoing Educational Aids and Curricula

Mechatronics Community Exchange (MCE). [Blog post]. Retrieved from <u>http://flate.pbworks.com/w/page/67850373/Mechatronics</u>.

This is a resource for a community of practice for two-year Mechatronics program educators. It contains educational resources, videos, monthly meeting recordings, and instructional material related to the latest in mechatronics.

FLATE Focus newsletter. *STEM at Work Puzzles*. [Blog post]. Retrieved from http://fl-ate.org. These award winning online puzzles currently comprise 52 curriculum objects which focus on the technology and engineering side of STEM and encourage problem based learning. A new puzzle is provided each month as a feature of the online (blog format) *FLATE FOCUS newsletter*, and archived online on the FLATE website.

FLATE/CA²VES (2015, June 22). *Exploring Advanced Manufacturing*. [Blog post]. Posted at https://educateworkforce.com/courses. This is a free online course resource, developed in partnership with the Center for Aviation and Automotive Technology Education, CA²VES, to help prepare students for a career in a technical vocation. Includes 43 modules on advanced manufacturing topics, 26 videos, assessments and virtual reality simulations.

FLATE/CA²VES. *Manufacturing Your Way to a Brighter Future Lesson*. This lesson explores the potential of finding a career in manufacturing while challenging students to consider and use science and engineering principles. [Blog post]. Retrieved from?

Florida Manufacturing Month Resources. [Blog post]. This site offers a variety of resources for educators, coordinators, and industries to guide them in participating and preparing for manufacturing month. Posted at <u>http://madeinflorida.org/manufacturing-day/</u>.

Industry Tour Educational Resources. These resources are designed for a student tour of a manufacturing facility and provide a rich experience for students, teachers and mentors/chaperones.

These are great tools and resources for Manufacturing Day Industry Tours and Events. Posted at <u>http://flate.pbworks.com/w/page/54539429/MFG%20Day%20Industry%20Tour%20Resources</u>

Websites/Online Resources

• "Made in Florida" Website http://madeinflorida.org



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This website has been integral to FLATE's effort to change the perception of students, parents, educators and the community about modern manufacturing and technical careers. Resources are designed to promote the student pipeline to advanced manufacturing colleges and careers. Within this website the following resources are available but not limited to:

http://madeinflorida.org/students/

This site help students to learn about manufacturing sectors and careers, skills required, animated careers pathways.

http://madeinflorida.org/engineering-technology-degree/e-t-overview/

This site provides information about Florida Colleges that offer the A.S. Engineering Technology Degree (ET), specializations, and certifications.

http://madeinflorida.org/manufacturing-day/

This site provides information and resources available to promote Manufacturing Day and month in Florida.

FLATE's wiki - Free Resources for Educators http://www.flate.pbworks.com

This educational resource includes, lesson plans for K-12, career pathways, modules for advanced technical education, resources supporting the recruitment of girls for STEM, High School Technology Initiative (HISTI), and FLATE's presentation content from conferences and events.

FLATE Homepage http://www.fl-ate.org

FLATE's homepage is an important dissemination platform for FLATE. It includes missions and goals, facts and Impact, industry partners, the FLATE FOCUS newsletter, publications, and professional development opportunities.

• *Manufacturing Stories: Promoting Manufacturing and STEM Education* http://manufacturingstories.com/

The primary goal of these stories is to strengthen the critical nexus between manufacturing and education primarily in K-12 CTE & STEM.



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Participants & Other Collaborating Organizations - Who has been involved?

Report progress on his/her institution's portion of the collaborative effort only.

Nomo	Most Senior	Nearest Person
Iname	Project Role	Month Worked
Barger, Marilyn	PD/PI	12
Gilbert, Richard	Co PD/PI	2
Danielly Orozco	Grant Manager-Associate Director	12

Full details of individuals who have worked on the project:

Marilyn Barger Email: barger@fl-ate.org Most Senior Project Role: PD/PI Nearest Person Month Worked: 12

Contribution to the Project: As the PI, Dr. Barger, drives the FLATE structure, service, and sustainability initiatives in curriculum reform and development, outreach, and professional development. Dr. Barger sets goals, objectives, and agenda (if applicable) for FLATE meetings such as NVC, NSF-ATE PI, Industry Advisory Council (IAC), Engineering Technology (ET) Forum. Dr. Barger also formulates and executes professional development workshops, presentations, and training in support of FLATE goals and objectives. Funding Support: NSF Identify whether this person is collaborating internationally on this project: Yes International Travel: No

Richard A Gilbert Email: gilbert@eng.usf.edu Most Senior Project Role: Co PD/PI Nearest Person Month Worked: 2

Contribution to the Project: Serves on FLATE's leadership committee. Supports and attends FLATE meetings such as NVC, NSF-ATE PI, Industry Advisory Council (IAC), and Engineering Technology (ET) Forum. Serves as liaison with the University of South Florida College of Engineering (COE). Partners with FLATE in curriculum reform and development, outreach, and professional development initiatives. Funding Support: In-kind International Collaboration: no International Travel: no

Danielly Orozco Email: dorozco@fl-ate.org Most Senior Project Role: Grant Manager-Associate Director Nearest Person Month Worked: 12





Contribution to the Project: Danielly is the grant manager-associate director of FLATE. Supports and helps FLATE's mission and goals with focus on sustainability initiatives in curriculum reform and development, outreach, and professional development.

What other organizations have been involved as partners?

Name	Type of Partner Organization	Location
College of Central Florida	Academic Institution	Ocala, FL
Florida Association for Industrial and Technical Educators (FAITE)	Other Organizations (foreign or domestic)	Orlando, FL
Florida Association for Career and Technical Education (FACTE)	Other Organizations (foreign or domestic)	Tallahassee, FL
FloridaMakes	State or Local Government	
Florida State College at Jacksonville	Academic Institution	Jacksonville, FL
General Motors Global Mfg. Systems	Industrial or Commercial Firms	Warren, MI
Gulf Coast State College	Academic Institution	Panama City, FL
Harris Corp.	Industrial or Commercial Firms	Melbourne, FL
Hillsborough Community College	Academic Institution	Tampa, FL
Hoerbiger Corp.	Industrial or Commercial Firms	Pompano Beach, FL
Iverson and Co.	Industrial or Commercial Firms	Des Plains, IL
Lake Sumter State College	Academic Institution	Leesburg, FL
Lockheed Martin Corp.	Industrial or Commercial Firms	Yorktown, VA
Baxter Healthcare Corporation	Industrial or Commercial Firms	Largo, FL
MATEC	Other Organizations	Phoenix, AZ
Manufacturing Skill Standards Council (MSSC)	Other Organizations (foreign or domestic)	Alexandria, VA
Mitsubishi Power Systems America	Industrial or Commercial Firms	Orlando, FL
National Association of Manufacturers (NAM)	Other Organizations (foreign or domestic)	Washington, D.C
Northwest Florida State College	Academic Institution	Niceville, FL
Palm Beach State College	Academic Institution	Boca Raton, FL

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Name	Type of Partner Organization	Location
Pensacola State College	Academic Institution	Pensacola, FL
Polk State College	Academic Institution	Lakeland, FL
Pratt & Whitney Rocketdyne	Industrial or Commercial Firms	West Palm Beach, FL
St. Petersburg College	Academic Institution	St. Petersburg, FL
State College of Florida Manatee-Sarasota	Academic Institution	Venice, FL
Broward College	Academic Institution	Coconut Creek, FL
Sun Hydraulics Corp.	Industrial or Commercial Firms	Sarasota, FL
Tallahassee Community College	Academic Institution	Tallahassee, FL
Tropicana Products	Industrial or Commercial Firms	Bradenton, FL
University of South Florida	Academic Institution	Tampa, FL
CONMED Corp.	Industrial or Commercial Firms	Largo, FL
CareerSource Florida	State or Local Government	Tallahassee, FL
College of Central Florida	Academic Institution	Ocala, FL
Daytona State College	Academic Institution	Daytona, FL
Eastern Florida State College	Academic Institution	Cocoa and Palm Bay, FL
Florida Dept. of Education	State or Local Government	Tallahassee, FL

What other collaborators or contacts have been involved?

Please refer to attachment for additional collaborators - FLATE Community of Practice.





What is the impact on the development of the principal discipline(s) of the project?

FLATE's impact on its educational, industry, and workforce partners is captured in a variety of metrics. FLATE data comes from stakeholder and participant surveys, FDOE databases, various web statistics, anecdotal comments, and other sources. These define our successes and impact as well as provide feedback for process improvements.

Regional/Statewide Impact:

FLATE collaborated with its industry and academic partners and the Florida Department of Education (FLDOE) to design the statewide Engineering Technology (ET) Associate in Science (AS) Degree Program. Now a national model, the ET degree offers a completely articulated program focused on a set of core courses aligned with stackable industry certifications offered by the National Association of Manufacturers (NAM) and the Manufacturing Skill Standards Council (MSSC). This helps students prepare for work on accelerated pathways.

FLATE is responsible for developing 21 FLDOE frameworks for 21 certificates and 11 specializations of the Engineering Technology Degree (AS/AAS) degree

Thanks to FLATE's mentorship and support, today 23 of Florida's 25 state and community colleges with manufacturing-related programs have adopted and implemented the AS ET Degree program. FLATE continues to mentor the ET Degree model to other related programs both in and outside of Florida on both new and updated academic programs.

Enrollment and completions report, prepared by FLATE with data provided by Florida Department of Education, indicates a continuous increase in in AS ET Degree program student enrollment. 2,062 students enrolled in AS ET Degree program during the academic year 2016-17, representing an impressive 86% increase when compared to 703 enrollments in 2012.

Minority enrollment in the AS ET Degree program has grown from 37% to 47% to match the 48% minority enrollment in comparable related degree programs. Favorable increment in AS ET Degree programs and growth in enrollments proves sustainability of a statewide-unified education system/curriculum reform and development for manufacturing education.

Model for integrating national skill standards into technician two-year degree curriculum.

Model for statewide articulation agreement for high school students and incumbent workers for 15 credit hours by achieving Manufacturing Skills Standards Council (MSSC). Partnership projects with the MSSC showing a continuous increase of credentials in Florida. 449 additional MSSC Certified Production Technicians (CPT) were added to bring the cumulative total to 14,062 since its introduction in 2006.

Model for industry-endorsed two-year curriculum for AS degrees in Engineering Technologies. PathTech LIFE is a collaboration led by the University of South Florida (USF) and FLATE. The purpose of this national survey is to understand how learning, interests, family, and employment (LIFE) experiences of two-year college students impact their decisions to enroll, return for





further coursework, and/or pursue a certificate or degree. 96 colleges and 1443 respondents have participated in this nation-wide survey.

FLATE has reached more than 100,000 Florida students, educators, and community members through its Made in Florida campaign. In 2017, FLATE facilitated nearly300 tours and outreach events to 130 high-tech, manufacturing facilities in Florida for over 8,900 students, and 1,400 educators and parents.

The 2017 Made in Florida MFG day/Month industry tours showed significant impact. Of the 2,202 student surveys collected statewide, 100% responses stated the tour was a good use of company time and resources, 83.5% increase in students' consideration of careers in advanced manufacturing after the tour. There was an impressive 93% change for girls, who responded the survey, considering a career in advanced manufacturing before and after the tour. Approximately 89% of surveyed students stated they would recommend other students have the same opportunity of this tour. 88% of students stated the tour helped them understand how STEM subjects are applied in advanced manufacturing industries. Of the industry tour hosts that responded to FLATE's surveys, 100% stated the tour was a good use of company time and resources. In an online post industry tour survey formulated and tabulated by FLATE, an industry tour host stated that they "enjoyed hosting the students," and that it was a "great opportunity to help middle school students understand manufacturing." For more information see 2017 Post Visit MFG Day Survey Results Cumulative Report in the attachment.

Successful Made in Florida outreach model that FLATE together with its network of statewide industry partners, RMA's, and schools worked cohesively to coordinate Made in Florida MFG Day/Month industry tours and events across the state

In-kind and cash partner engagement included participation in Made-In-Florida tours, MFG Day tours and activities, and sponsorships continues to increase. The cash and In-Kind contributions increased 59% an 67% respectively from 2016 to 2017.

FLATE continued strengthening PD partnerships with other nationwide recognized organizations to provide professional development opportunities. Number of PD hrs increased 27% in 2017. FLATE provided 9,089 hours of professional development to 3,268 educators and counselors (K-14) and 2,280 workforce, economic and manufacturing personnel in multi-day workshops, presentations, and through online webinars, presentations or workshops at hundreds of events in Florida, nationally, and worldwide.

Public dissemination through madeinflorida.org and fl-ate.org websites, blogs, and educator resources at flate.pbworks.com have served over 41,603 visitors in 2017.

The FLATE FOCUS online blog format newsletter generated over 4,560 sessions from 3,395 users, 17,246 total page views, average of 3.78 page views per session. Distributed and reviewed in US and 97 countries.

Received the 2018 Florida Career Pathways Best Practice Awards for "Robotics: A tool for integrating STEM disciplines" and "Factors Affecting Engineering



www.FL-ATE.org • www.MadelnFlorida.org • www.flate.pbwiki.com

NSF-

Technology Pathways- Sharing real students' perspectives to help increase recruitment and retention in your program."

Ten published FLATE Best Practices guides

Quote:

"Dear Ron and Gretchen: I would recommend that you look at the newsletter from FLATE from Marilyn Barger's Organization. They are offering professional development opportunities to high school educators in Fanuc Robotics and MSSC. They are a model for us to watch."

Patricia Kelly Lee Community College of Allegheny County West Hills Center-NSF, Project Coordinator/Mechatronics 1000 McKee Road, Oakdale, PA 15071-1099

What is the impact on other disciplines?

Enrollment and completion data for the ET AS degree program continue showing favorable trends and growing enrollments. Especially noteworthy are the comparative enrollment data for related technology programs in Florida. 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 since the 2011-2012 academic year shows an average positive trend of about 256 enrollments per year, while that in all the rest of the AS manufacturing related programs shows an average negative slope of 345 enrollments per year. The relative annual growth in enrollments in the ET AS degree program in consistently higher than other related technology AS degree programs. Refer to the 2012-2017 Florida Engineering Technology and Related Program Student Enrollment and Completion five-Year Trend Study in the attachment.

The FLATE model for curricula topic Forums (i.e. ET Forum) among the state and community colleges has been duplicated in Florida. There are three statewide programs that adopted and implemented the ET Forum model. These are the Florida Aviation and Aerospace Forum, the Fire Fighters education programs, meeting twice annually, and the Florida Energy Teachers Network (FETN) meeting once each year.

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 additional Forums have been developed and implemented in Florida.

The University of Florida, the Advanced Regenerative Manufacturing Institute (ARMI), and FLATE hosted the ARMI Education & Workshop Development Summit Pathways on June 2018 in Tampa, Florida. Approximately 50 participants with different backgrounds and areas of expertise from all over the country meet during two days to identify and analyze gaps in the ARMI's mission is make practical the large-scale manufacturing of engineered tissues and tissue-related technologies, to benefit existing industries and grow new ones. Based on FLATE's AS ET degree model, recommendations were made regarding ways to organize a path forward for the ARMI Education & Workforce Development community.

What is the impact on the development of human resources?

FLATE continues to be Florida's leading resource for education and training expertise to promote and support the workforce in the high-performance production and manufacturing community.

FLATE Provides an effective outreach and dissemination platform for Florida's high school, community college, industry and legislature for information related to the requirements for and impact of manufacturing education.

FLATE delivers professional development opportunities for technical faculty and educators in STEM curriculum to develop refine or certify their knowledge base within manufacturing and/or its related enabling technologies and educational pedagogies. FLATE provided numerous hours of PD in multi-day workshops, presentations, and through online webinars at hundreds of events in Florida, nationally, and worldwide. In 2017, PD activity participant feedback was that overall development value was scored at an average of 4.8 on a scale of 1 to 5 (1 = Poor; 2 = Fair; 3 = Good; 4 = Very Good; 5 = Excellent).

The ET AS degree program with embedded industry and academic credentials offers students a variety of technical specializations pathways built upon a common technical core that help prepare students for many jobs in manufacturing and other high-technology industries. The use of FLATE's pathway for attaining this employer-preferred credential continues to grow in Florida.

The ET Forum continues to be a popular and productive, well-attended event, which allows state college 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 free online educational resources are intended to increase student's awareness and interests in the field of manufacturing and all the careers it represents. It features STEM-centered, industry-connected lesson plans for K-12 school teachers and their students. Includes support materials for tours to high-tech industries, and resources to help engage and recruit girls to STEM curriculum and support technology career pathways.

What is the impact on physical resources that form infrastructure?

FLATE continues providing support and mentorship for high schools, Post-Secondary Adult Vocational (PSAV) technical programs, and ET AS college programs during their institutional implementation phase through ET equipment grants, program changes and additions, adoption of credentials, as well as providing individual college support with statewide promotional campaign materials for unified curriculum aimed at both the educational communities (student, parents, counselors, teachers, etc.) and manufacturing industries.

What is the impact on institutional resources that form infrastructure?

Some of the most important evaluation and reform of the ET curriculum is performed during the bi-annual ET Forum. As of 2017, the ET degree has been adopted by 23 Florida community and state colleges.

What is the impact on information resources that form infrastructure?

Free online information and educational resources continues positively to support technical educators with hi-tech modules and presentations to keep them up to date with technology education. FLATE's award winning, industry aligned online STEM curriculum is made available for adoption, or adaptation, providing an accessible and viable information resource. (Refer to the description of *FLATE's wiki* – online curriculum resources for educators in the product section of this report). In addition, a shared, online, collaborative Wiki resource repository provides ET faculty with ET related curriculum and related content at *madeinfloira.org*.

What is the impact on technology transfer?

As we embark on the Fourth Industrial Revolution, it is clear that technology will continue playing a central role and will affect nearly all aspects of our lives. To prepare the future of the US talent needed for the digital economy, education must adapt as fast as the demand for





growing and evolving technical skills. It is imperative that ATE Centers including FLATE ensure the sustainability of resources for education and training supporting the high-performance skilled workforce for Florida and nation wide's manufacturing sectors.

As mentioned earlier, ET AS degree program recruitment and graduation rates continue to grow indicating a potential impact on the Florida workforce. Students will transfer their ET knowledge, skills, and abilities in advanced technology education to the advanced manufacturing workforce, coinciding with the state of Florida's targeted focus to grow manufacturing statewide, as well as with the articulated national need for an educated and skilled manufacturing workforce. FLATE's statewide articulation agreement based on industry certification has been a model for other career education programs in Florida as well as other states. This model has been endorsed by the National Association of Manufacturers (NAM) in their Skill Certification System (SCS) and has been identified as a national model for successful career pathways.

All ET AS degree holders can transfer seamlessly to a number of Bachelor of Applied Science (BAS) degrees offered in Florida's universities and colleges. The 2 + 2 agreements apply 60 credit hours of an AS degree directly to this 4-year bachelor's degree. A second option is for ET AS graduates to transfer to Daytona State College's B.S.E.T. degree, which articulate to 59-62 credits. The B.S.E.T. requires additional general education credits and may require technical prerequisite courses.

What is the impact on society beyond science and technology?

FLATE and its partners have demonstrated that working together is the key for a better-educated and job-ready workforce in any area beyond science and technology.

Beyond science and technology, society needs desperately workers with soft skills that are essential in today's work and personal relationships. These soft skills include active listening, effective communication, team-building, flexibility/adaptability, critical thinking and problem solving. FLATE is aware of this critical aspect and has designed the *Toothpick Factory*©-TPF. TPF is a hands-on activity that stimulates discussion and awareness about a wide range of soft skills. These are workplace standards of behavior needed by employees to interact and cooperate effectively with co-workers. The hands-on activity engages participants in a non-threatening simulation so they can focus on teamwork and communication skills.

FLATE has developed and supported a strong community of practice through the ET Forum a community of technical educators and stakeholders that has grown and continues to impact local communities' awareness of the economic and social impacts of advanced manufacturing. FLATE has worked to increase the diversity of student enrollment to include many underrepresented groups and therefore, has positively affected the diversity of the workforce in Florida.





Changes/ Problems

Changes in approach and reasons for change

As FLATE sunsets and the end of the grant award approaching, FLATE leadership and staff will continue its focus on mission sustainability and continuous improvement of activities and processes. For this effort, FLATE constantly updates and use the sustainability matrix for prioritizing and describing potential opportunities. FLATE will continue strengthening existing partnerships and opening opportunities for new geographically diverse stakeholders, customers, and partners capable and willing to assume designated functions, beyond the life of the Center. FLATE will continue focusing on recruitment of female and minority participants into manufacturing education programs.

FLATE will also focus on completing the objectives of its supplemental funding awarded in early summer 2018. Goal (A) Conduct a set of workshops to build a statewide Community of Practice of 2-year degree faculty and regional associations that also focus their resources in support of advanced manufacturing in Florida. Goal (B) Create professional development activities for faculty to provide students the mechatronics-based knowledge and skills manufacturers' require of technicians that support controlled manufacturing environments.

Actual or Anticipated problems or delays and actions or plans to resolve them

Nothing to report

Changes that have significant impact on expenditures, Nothing to report

Significant changes in use or care of human subjects, Nothing to report

Significant changes in use or care of vertebrate animals , Nothing to report

Significant changes in use or care of biohazards, Nothing to report

Special Requirements

• Respond to any special reporting requirements specified in the award terms and conditions, as well as any award specific reporting requirements.

Nothing to report

APPENDIX



Florida Advanced Technological Education Center of Excellence



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2012-2017 Florida Engineering Technology (ET) and Related Program Student Enrollment and Completion

5-Year Trend Study

FLATE, a National Science Foundation Regional Center of Excellence, annually requests and compiles student enrollment and completion data for the Engineering Technology (ET) and related A.S. and B.S. degrees and college credit certificate (CCC) programs for Florida colleges, and for related technology programs at the secondary and PSAV level. These data, provided by the Florida Department of Education, are reliable but do not include enrollment for undeclared majors or enrollment in duplicate programs (such as certificates under degree programs). College Registrar reporting/cut dates also result in some reported enrollment discrepancies. Minor anomalies may occur as older program titles are collapsed and added program titles are added. This review contains five sections and an appendix with individual ET adopting college performance, and presents a 5-year trend study which includes the 2016-17 FLDOE report year.

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Section 1:	FIORIDA EN	aineerina re	echnolody (r	- I) and I	Related AS	Jearee Pr	ooram Studen	renromment
		g						

- I a. Engineering Technology AS Degree Program Student Enrollment 5 Year Trend
- I b. Related Technology AS Degree Program Student Enrollment (excludes ET) 5 Year Trend
- I c. Selected Demographic Profile for ET and Related AS Technology Program Student Enrollment
- I d. Engineering Technology and Related AS Degree Student Enrollment by Program
- I e. Engineering Technology and Related BS Degree Student Enrollment by Program
- I f. Selected Demographic Profile for ET and Related BS Degree Student Enrollment

Section II: Florida Engineering Technology (ET) and Related Degree Program Student Completion

- II a. Engineering Technology AS Degree Program Completion 5 Year Trend
- II b. Related Technology AS Degree Program Completion (excludes ET) 5 Year Trend
- II c. Selected Demographic Profile for ET and Related AS Technology Program Student Completion
- II d. Engineering Technology and Related AS Degree Student Completion by Program
- II e. Engineering Technology and Related BS Degree Student Completion by Program
- II f. Selected Demographic Profile for ET and Related BS Degree Student Completion

Section III: Florida ET and Related Technology College Credit Certificate Student Enrollment by Program

Section IV: Florida ET and Related College Credit Certificate Student Completion by Program

Section V: Secondary Student Enrollment and Graduation in Florida Technology Programs

V a. Total Secondary Student Enrollment and Graduation - 5 Year Trend

- V b. Secondary Student Enrollment by Technology Program
- V c. Secondary Student Graduation by Technology Program
- V d. Selected Secondary Level Technology Program Demographics including Internships

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

Appendix: Total ET & Related Technology Enrollment by College

Section I: Florida Engineering Technology (ET) and Related AS Degree Program Student Enrollment

2012-13	2013-14	2014-15	2015-16	2016-17
1,109	1,525	1,686	1,776	2,062
14	15	19	19	19
	2012-13 1,109 14	2012-13 2013-14 1,109 1,525 14 15	2012-13 2013-14 2014-15 1,109 1,525 1,686 14 15 19	2012-13 2013-14 2014-15 2015-16 1,109 1,525 1,686 1,776 14 15 19 19

*Out of Florida's 28 Community and State Colleges



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I b. Related Technology AS Degree Program Student Enrollment Excluding ET Degree and		2012-13	2013-14	2014-15	2015-16	2016-17		
CCC P	rograms			4,195	3,244	2,963	2,942	3,015
	7,000		ib. Related Technolog (excludes ET a	y AS Progra & CCC progr	m Enrollmo rams)	ent		
Earollmont	5,000 3,000	4,195	3,244	2,96	3	2,942	3,1	015
	1,000	2012-13	2013-14	2014-15		2015-16	201	16-17

In 2015-16 ET AS Degree program represented 38% of total Florida technology AS degree program enrollment (N=4,718). In 2016-17 ET AS Degree program represented 41% of total Florida technology AS degree program enrollment (N=5,054).

I c. Selected Demographic Profile for ET and Related Technology AS Degree Program Enrolled Students								
	2012-13	2013-14	2014-15	2015-16	2016-17			
ET Technology Program % Female Enrollment	9%	10%	10%	12%	11%			
Related Technology Program % Female Enrollment	19%	16%	20%	24%	27%			
ET Technology Program % Minority Enrollment	41%	55%	47%	46%	47%			
Related Technology Program % Minority Enrollment	45%	50%	52%	49%	48%			
I.d. Engineering Technology and Related Technology Enrollment b	v Program (do	es not inclu	de certificate	es)				
() Indicates number of colleges offering the program for the 2015-1	6 Academic Y	ear.						
ATC: Advanced Technology Credit for POST AA/AS degree student	s.							
AS Degree Programs								
(19) Engineering Technology (ET) Degree Enrollment	1,109	1,525	1,686	1,776	2,062			
Note - FLDOE does not provide ET enrollment by specialization.								
(1) Aerospace Technology	66	89	103	112	126			
(5) Biomedical Engineering Technology	380	242	201	183	209			
(3) Biomedical Egineering Technology ATC (added)					29			
(3) Chemical Technology	611	267	382	645	804			
(11) Drafting & Design Technology	742	609	530	506	500			
(1) Electrical Distribution Technology	31	35	31	27	30			
(3) Electrical Power Technology	433	319	230	184	173			
(7) Electronics Engineering Technology	1,333	1,187	1,071	965	870			
(15) Industrial Management Technology	542	459	399	294	238			
(1) Manufacturing Technology	16	10	0	10	*			
(1) Simulation and Robotics Technology	27	19	16	16	13			
(1) Telecommunications Engieering (added)					*			
Total Degree Enrollment / ET and Related	5,290	4,761	4,649	4,718	5,054			
I.e. ET Bachelor Degree (BSET) Student Enrollment with #								
Offering Colleges Shown in ()	2012-13	2013-14	2014-15	2015-16	2016-17			
Total BSET Enrollment Offering								
College & Program Name with Enrollment	610 (4)	675 (4)	567 (4)	538 (4)	486 (3)			
Daytona State College* - Engineering Technology	306	396	380	218	180			
State College of Florida** - Energy Technology Management	15	23	27	none re	eported			
Miami Dade College - Electronics Engineering Technology	73	95	125	143	118			
Valencia College - Electronics Engineering Technology	66	96	143	177	188			

* Hybrid online program **Selected courses available online



Section II: Florida Engineering Technology (ET) and Related Degree Program Student Completion								
II a. Engineer	ring Technology (ET) AS Degree Program Completic	2012-13	2013-14 80	2014-15 110	2015-16 none available	2016-17 125		
	IIa. Engineering Technolo	gy (ET) AS Pro	gram Com	pletions	<u> </u>			
150								
1 00	83	80		110				
	32							
E 30								
-	2011-12 2012-13	2013-14		2014-15	201	5-16		
II b. Related	Technology AS Degree Completion	2012-13	2013-14	2014-15	2015-16	2016-17		
Excludes ET	Degree and College CCC Programs	531	422	346	none ava	ailable		
	IIb. Related Technology A	S Degree Pro	gram Comj	oletions				
₽ ⁶⁰⁰	499 531	/22						
4 00		422		346				
200								
ш. _	2011-12 2012-13	2013-14		2014-15	201	5-16		
			0.1		() (AL (50)			
In 2014-15 the In 2015-16, 20	e ETAS Degree program represented 24 % of total Flo 016-17 the ETAS Degree program completions were n	ot available	S degree pro	gram comple	tions (N=456).			
II c. Selected	I Demographic Profile for ET and Related Technolog	y AS Degree Pro	ogram Comp	letion				
		2012-13	2013-14	2014-15	2015-16	2016-17		
ET Technolog	gy Program % Female Completion	12%	17%	7%	none ava	ailable		
Related Tech	nology Program % Female Completion	19%	17%	16%	none ava	ailable		
ET Technolog	gy Program % Minority Completion	33%	34%	36%	none ava	ailable		
Related Tech	nology Program % Minority Completion	30%	30% 39% 51% none a		none ava	ailable		
II d. Engineer Does not inc	ring Technology and Related Technology College D lude college credit certificates-CCC	egree Completic	on by Progra	m				
AS Degree C	completion	2012-13	2013-14	2014-15	2015-16	2016-17		
AS Degree C Aerospace Te	completion	2012-13 9	2013-14 13	2014-15 18	2015-16 none ava	2016-17 ailable		
AS Degree C Aerospace Te Biomedical Er	c ompletion echnology ngineering Technology	2012-13 9 53	2013-14 13 38	2014-15 18 27	2015-16 none ava none ava	2016-17 ailable ailable		
AS Degree C Aerospace Te Biomedical Er Biomedical Ec	completion echnology ngineering Technology quipment Technician (added)	2012-13 9 53	2013-14 13 38	2014-15 18 27	2015-16 none ava none ava none ava	2016-17 ailable ailable ailable		
AS Degree C Aerospace Te Biomedical Er Biomedical Ec Chemical Tec	completion echnology ngineering Technology quipment Technician (added) chnology	2012-13 9 53 34	2013-14 13 38 23	2014-15 18 27 21	2015-16 none ava none ava none ava none ava	2016-17 ailable ailable ailable ailable		
AS Degree C Aerospace Te Biomedical Er Biomedical Ec Chemical Tec Computer Inte	Completion echnology ngineering Technology quipment Technician (added) chnology egrated Manufacturing	2012-13 9 53 34 2 2	2013-14 13 38 23 23 2 70	2014-15 18 27 21 0 60	2015-16 none ava none ava none ava none ava none ava	2016-17 ailable ailable ailable ailable ailable ailable		
AS Degree C Aerospace Te Biomedical Er Biomedical Ec Chemical Tec Computer Inte Drafting & De Electrical Dist	Completion echnology ngineering Technology quipment Technician (added) chnology egrated Manufacturing sign Technology ribution Technology	2012-13 9 53 34 22 90 3	2013-14 13 38 23 23 2 79 2	2014-15 18 27 21 0 60 2	2015-16 none ava none ava none ava none ava none ava none ava none ava	2016-17 ailable ailable ailable ailable ailable ailable ailable		
AS Degree C Aerospace Te Biomedical Er Biomedical Ec Chemical Tec Computer Inte Drafting & Des Electrical Dist Electrical Pow	Completion echnology ngineering Technology quipment Technician (added) chnology egrated Manufacturing isign Technology tribution Technology ver Technology	2012-13 9 53 34 22 90 33 87	2013-14 13 38 23 2 2 79 2 49	2014-15 18 27 21 0 60 22 29	2015-16 none ava none ava none ava none ava none ava none ava none ava none ava none ava	2016-17 ailable ailable ailable ailable ailable ailable ailable ailable		
AS Degree C Aerospace Te Biomedical Er Biomedical Ec Chemical Tec Computer Inte Drafting & De Electrical Dist Electrical Pow Electronics Er	Completion echnology ngineering Technology quipment Technician (added) chnology egrated Manufacturing rsign Technology tribution Technology ver Technology ngineering Technology	2012-13 9 53 34 2 90 33 3 87 107	2013-14 13 38 23 23 29 79 2 49 116	2014-15 18 27 21 0 60 2 29 123	2015-16 none ava none ava	2016-17 ailable ailable ailable ailable ailable ailable ailable ailable ailable		
AS Degree C Aerospace Te Biomedical Er Biomedical Ec Chemical Tec Computer Inte Drafting & De Electrical Dist Electrical Pow Electronics Er Engineering	Completion echnology ngineering Technology quipment Technician (added) chnology egrated Manufacturing usign Technology tribution Technology ver Technology ngineering Technology reference tribution Technology ver Technology reference rechnology	2012-13 9 53 34 2 90 3 3 87 107 83	2013-14 13 38 23 23 23 29 79 2 49 116 80	2014-15 18 27 21 0 60 2 29 123 110	2015-16 none ava none ava	2016-17 ailable ailable ailable ailable ailable ailable ailable ailable ailable ailable		
AS Degree C Aerospace Te Biomedical Er Chemical Tec Computer Inte Drafting & De Electrical Dist Electrical Pow Electronics Er Engineering Industrial Mar	completion echnology ngineering Technology quipment Technician (added) chnology egrated Manufacturing usign Technology tribution Technology ver Technology ngineering Technology reference ngineering Technology ngineering Technology nagement Technology	2012-13 9 53 34 2 90 33 87 107 83 134	2013-14 13 38 23 23 2 79 2 49 116 80 141	2014-15 18 27 21 0 60 22 29 123 110 98	2015-16 none ava none ava	2016-17 ailable ailable ailable ailable ailable ailable ailable ailable ailable ailable		
AS Degree C Aerospace Te Biomedical Er Biomedical Ec Chemical Tec Computer Inte Drafting & De Electrical Dist Electrical Pow Electronics Er Engineering Industrial Mar Manufacturing	completion echnology ngineering Technology quipment Technician (added) chnology egrated Manufacturing isign Technology ribution Technology ver Technology ngineering Technology ngineering Technology ngineering Technology g Technology nagement Technology g Technology	2012-13 9 53 34 2 2 90 33 3 87 107 83 83 1134 4 4	2013-14 13 38 23 23 2 79 2 49 116 80 141 3 2	2014-15 18 27 21 0 60 29 123 110 98 0 2	2015-16 none ava none ava	2016-17 ailable ailable ailable ailable ailable ailable ailable ailable ailable ailable		
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AS Degree C Aerospace Te Biomedical Er Biomedical Ec Chemical Tec Computer Inte Drafting & Des Electrical Dist Electrical Pow Electronics Er Engineering Industrial Mar Manufacturing Robotics & Si Telecommuni Total College	completion echnology ngineering Technology quipment Technician (added) chnology egrated Manufacturing sign Technology ribution Technology ver Technology ngineering Technology ribution Technology rechnology agement Technology g Technology imulation Technology imulation Technology g Technology ications Engineering Technology (added)	2012-13 9 53 34 2 90 33 87 107 83 134 4 4 7 531	2013-14 13 38 23 2 79 2 49 116 80 141 3 2 548	2014-15 18 27 21 0 60 29 123 110 98 0 2 490	2015-16 none ava none ava	2016-17 ailable ailable ailable ailable ailable ailable ailable ailable ailable ailable ailable ailable ailable ailable ailable ailable		
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Section III: Florida ET and Related College Credit Certificate (CCC) Student Enrollment by Program								
ET Program College Credit Certificate Enrollment (CCC)	2012-13	2013-14	2014-15	2015-16	2016-17			
(3) CCC - Alternative Energy Systems Specialist	9	12	0	none reported	none reported			
(1) CCC - Applied Technology Specialist	9	6	0	none reported	none reported			
(5) CCC - Automation	7	9	10	17	32			
(4) CCC - CNC Machinist	16	32	18	66	45			
(2) CCC - CNC Machinist Operator/Programmer				none reported	none reported			
(1) CCC - Composite Fabrication & Testing	7	4	0	none reported	none reported			
(3) CCC - Computer- Aided Design & Drafting	14	21	19	31	36			
(3) CCC - Electronics Aide	1	3	0	none reported	13			
(17) CCC - Engineering Technology Support Specialist	36	33	105	129	133			
(1) CCC - Lean Manufacturing	1	2	0	none reported	none reported			
(2) CCC - Lean Six Sigma Green Belt	10	16	29	16	24			
(3) CCC - Mechatronics				43	51			
(1) CCC - Mechanical Designer and Programmer (added)	-			none reported	none reported			
(1) CCC - Medical Quality Systems	3	16	14	. 10	none reported			
(8) CCC - Pneumatics, Hydraulics & Motors for Manufacturing	5	21	48	40	. 47			
(1) CCC - Rapid Prototyping Specialist (added)				27	27			
(1) CCC - Six Sigma Black Belt	13	9	13	none reported	none reported			
Total ET Program CCC Enrollment	131	184	256	379	408			
Related Technology College Credit Certificate Enrollment by Progra	am							
(3) CCC - Alternative Energy Engineering Technology	14	13	5	0	13			
(13) CCC - AutoCAD foundations (added)					226			
(3) CCC - Basic Electronics Technician	79	89	83	68	63			
(2) CCC - Chemical Laboratory Specialist	30	52	58	65	54			
(1) CCC - Computer Automation Technology (added)					none reported			
(1) CCC - Computerized Woodworking	1	1	0	0	0			
(1) CCC - Digital Manufacturing Specialist (added)					none reported			
(1) CCC - Electrical Distribution, Advanced	6	4	3	0	none reported			
(1) CCC - Electrical Distribution, Basic	22	26	29	34	21			
(4) CCC - Electronics Technician	17	22	16	41	96			
(3) CCC - Laser and Photonics Technician	12	15	17	34	25			
(10) CCC - Logistics & Transportation Specialist (added)	40	248	152	92	553			
(3) CCC - Robotics and Simulation Technology (added)	2	0	0	0	27			
(3) CCC - Robolics and Simulation Technology (added)	2							
(3) CCC - Scientific Workplace Prep	1	21	159	803	1558			
(3) CCC - Scientific Workplace Prep (1) CCC - Solar Energy Technician (added)	1	21	159	803	1558 12			
(3) CCC - Scientific Workplace Prep (1) CCC - Solar Energy Technician (added) Related Technology CCC Enrollment	1 224	21 491	159 522	803 1137	1558 12 2,648			



III. ET & Related College Credit Certificate (CCC) Enrollment Demographic Profile	2012-13	2013-14	2014-15	2015-16	2016-17			
% ET & Related CCC Female Enrollment	29%	33%	52%	55%	55%			
% ET & Related CCC Minority Enrollment	52%	44%	47%	50%	53%			
Growth to 55 in % female enrollment in 2016-17 is primarily attributed to 1,203 females enrolled in Scientific Workplace & 81 in Logistics and Transportation Specialist at FL State College at Jacksonville.								
ET Cartificate Student Completion by Program								
(3) CCC - Alternative Energy Systems Specialist	2012-13	2013-14	2014-13	none reported	none reported			
(1) CCC - Applied Technology Specialist	7	8	0	0	none reported			
(5) CCC - Automation	7	8	2	0	. 10			
(4) CCC - CNC Machinist	21	33	8	29	18			
(2) CCC - CNC Machinist Operator/Programmer (added)				none reported	none reported			
(1) CCC - Composite Fabrication & Testing	12	5	0	0	4			
(3) CCC - Computer Aided Design & Drafting	3	8	5	10	15			
(2) CCC Electronico Aido	6	15	0	1	12			

ET Certificate Student Completion by Program (Cont.)	2012-13	2013-14	2014-15	2015-16	2016-17
(17) CCC - Engineering Technology Support Specialist	43	61	93	72	96
(1) CCC - Lean Manufacturing	1	4	0	3	none reported
(2) CCC - Lean Six Sigma Green Belt	1	4	0	27	24
(3) CCC - Mechatronics (added)	28	27	23	20	18
(1) CCC - Mechanical Designer and Programmer (added)				0	none reported
(1) CCC - Medical Quality Systems	28	27	23	8	none reported
(8) CCC - Pneumatics, Hydraulics & Motors for Manufacturing	6	22	25	21	19
(1) CCC - Rapid Prototyping Specialist (added)				28	23
(1) CCC - Six Sigma Black Belt	21	10	16	0	none reported
Total ET Certificate Completion by Program	172	231	179	222	239
Related Technology Program Certificate Completion	2012-13	2013-14	2014-15	2015-16	2016-17
(2) CCC - Alternative Energy Engineering Technology	4	4	0	3	3
(13) CCC - AutoCAD foundations (added)	419	211	183	137	130
(3) CCC - Basic Electronics Technician	78	102	57	61	51
(2) CCC - Chemical Laboratory Specialist	12	32	31	24	13
(1) CCC - Computer Automation Technology (added)				none reported	none reported
(1) CCC - Computerized Woodworking	7	2	0	8	5
(1) CCC - Digital Manufacturing Specialist (added)				none reported	none reported
(1) CCC - Electrical Distribution, Advanced	1	1	0	5	none reported
(1) CCC - Electrical Distribution, Basic	1	2	12	3	5
(4) CCC - Electronics Technician	10	25	15	33	55
(3) CCC - Laser and Photonics Technician	13	20	31	17	24
(10) CCC - Logistics & Transportation Specialist (added)	203	126	39	47	90
(3) CCC - Robotics and Simulation Technology (added)	0	0	0	7	20
(3) CCC - Scientific Workplace Prep	36	37	491	575	727
(1) CCC - Solar Energy Technician (added)					11
Related Technology Program Certificate (CCC) Completion	333	386	859	917	1,134
Total Certificate Completion ET & Related CCC	461	529	953	781	1,373

IV. Engineering Technology and Related College Credit Certificate (CCC) Completions 5 Year Trend



ET & Related College Credit Certificate Completion Demographic					
Profile	2012-13	2013-14	2014-15	2015-16	2016-17
% ET & Related CCC Female Completion	34%	25%	49%	52%	53%
% ET & Related CCC Minority Completion	61%	50%	42%	46%	99%

Section V: Secondary Student Enrollment and Graduation in Florida Technology Programs

V a. Total Secondary Student Enrollment and Graduation - 5 Year Trend						
For 2016-17 report, five secondary programs were added 2012-13 2013-14 2014-15 2015-16						
654	647	613	587	832		
23,807	23,292	21,449	21,298	33,134		
Total Secondary Technology Student Program Graduates 3,529 3,384 3,266 3,269 5,05						
	2012-13 654 23,807 3,529	2012-13 2013-14 654 647 23,807 23,292 3,529 3,384	2012-13 2013-14 2014-15 654 647 613 23,807 23,292 21,449 3,529 3,384 3,266	Z012-13 Z013-14 Z014-15 Z015-16 654 647 613 587 23,807 23,292 21,449 21,298 3,529 3,384 3,266 3,269		

Va. Secondary Student Enrollment and Graduation in
Florida Technology Programs

40.000 -		Fiorida I	echnology Progra	ams		
30,000 -	23,807	23,292	21,449	21,298	33,134	Secondary Tech Student Course Enrollment
10,000 -	3,529	3,384	3,266	3269	5,058	Secondary Tech Student Program Graduates
	2012-13	2013-14	2014-15	2015-16	2016-17	

V b. Secondary Student Enrollment by Technology Program					
Program Title	2012-13	2013-14	2014-15	2015-16	2016-17
Applied Engineering Technology (added)					6079
Applied Robotics (added)					3533
Applied Welding Technologies	1,116	1,495	1,488	808	368
Automation & Production Technology (FLDOE adopted 2010)	186	336	494	686	1,178
Drafting/Illustrative Design Technology (added)					574

Appendix: 1 otal ET & Related Technology Enrollment by College Includes Total Student Enrollment by College for ET and Related Technology AS Degrees and ET and Related College Credit Certificates							
Source: FLDOE College Credit Student Data Base							
Highlight indicates adoption of ET Degree	2012-13	2013-14	2014-15	2015-16	2016-17		
Broward College	346	361	417	429	608		
College of Central Florida	85	65	44	52	94		
Chipola College (added 2015 adoption)	0	0	0	23	29		
Daytona State College	152	147	155	248	125		
Eastern Florida State College	1003	835	921	1132	1165		
Florida Gateway College	20	30	19	37	59		
Florida SouthWestern Florida State College (Formerly Edison)	123	63	23	none reported	none reported		
Florida State College at Jacksonville	574	581	1276	1959	2256		
Gulf Coast State College	108	114	123	113	85		
Hillsborough Community College	324	319	325	546	435		
Indian River State College	335	281	282	204	282		
Lake Sumter State College (added 2015 adoption)	58	58	65	64	111		
Miami Dade College	498	408	364	624	258		
Northwest Florida State College	229	172	146	247	179		
Palm Beach State College (added 2015 adoption)	182	158	156	182	246		
Pasco-Hernando State College (added 2015 adoption)	65	64	63	105	137		
Pensacola State College	275	259	170	141	151		
Polk State College	137	187	165	224	213		
St. Johns River State College	27	26	15	68	11		
St. Petersburg College	313	362	434	461	507		
Santa Fe College	132	78	80	93	112		
Seminole State College	51	56	78	74	214		
South Florida Community College	33	15	0	31	17		
State College of Florida Manatee-Sarasota	153	154	122	98	89		
Tallahassee Community College	137	102	73	71	87		
Valencia Community College	752	763	730	795	663		
Total Enrollment for all Institutions*	6,112	5,658	6,246	8,021	8,133		

*The Total Enrollment by College appendix includes AS enrollment for Engineering Technology (ET) and Related Technology AS programs and ET and Related Technology College Credit Certificates (CCC). All data reported here is extracted by reports provided by the FLDOE. Reporting by FLATE in this report begins with college ET adoption year. Some added adopters and programs are too recent to display FLDOE data.

Enrollment discrepancies may exist due to enrollment coding at the individual institutional level, for instance, a student working towards the ET AS degree may be coded as a certificate enrollment, change of major form has not been recorded, or reporting by the office of the registrar may be in error, etc. Certificates refer to College Credit Certificates (CCC).

Appendix page 1 of 3

5-Year Enrollment Breakout for Colleges Adopting the Engineering Technology (ET) Degree Program						
College Name and Enrollment Type	2012-13	2013-14	2014-15	2015-16	2016-17	
Proward Callage (PC) Adapted ET 2012						
ET AS Degree Enrollmont	147	271	227	250	224	
ET AS Degree Enrolment	147	2/1	327	239	304	
ET Certilicate Enfoliment	3	75	30	20	30	
Related Certificate Enrollment	15	15	19	27	24	
Total	346	361	417	429	608	
College of Central Florida (CCF) Adopted ET 2008	0.0			.20		
ET AS Degree Enrollment	56	48	44	52	94	
ET Certificate Enrollment	1	3	0	na	na	
Related AS Degree Enrollment	28	14	0	na	na	
Related Certificate Enrollment	0	0	0	na	na	
Total	85	65	44	52	94	
Chipola College (CC) Adopted ET 2016						
ET AS Degree Enrollment				23	29	
ET Certificate Enrollment				na	na	
Related AS Degree Enrollment				na	na	
Related Certificate Enrollment				na	na	
Total				23	29	
Daytona State College (DSC) Adopted ET 2012						
ET AS Degree Enrollment		na			27	
E l Certificate Enrollment	4.47	10.1		na	na	
Related AS Degree Enrollment	147	134	141	236	86	
Related Certificate Enrollment	5	13	14	12	12	
Total	152	147	155	248	125	
Eastern Florida State College (EFSC) Adopted ET 2008						
ET AS Degree Enrollment	174	198	172	157	165	
ET Certificate Enrollment	32	30	10	19	20	
Related AS Degree Enrollment	750	443	568	825	871	
Related Certificate Enrollment	47	164	171	131	109	
Total	0	835	921	1132	1,165	
Elorida State College at Jay (ESC I.) Adopted ET 2009					,	
FT AS Degree Enrollment	84	136	141	150	145	
ET Certificate Enrollment	15	166	121	152	189	
Related AS Degree Enrollment	196	208	203	300	134	
Total	•					
Florida Gateway College (FGC) Adopted ET 2009						
ET AS Degree Enrollment	8	20	19	18	24	
ET Certificate Enrollment	5	2	0	*	12	
Related AS Degree Enrollment	1	0	0	19	23	
Related Certificate Enrollment	6	8	0	*	na	
	20	30	19	37	59	
Guif Coast State College (GCSC) Adopted ET 2012		E1	104	112	95	
		51	104	113	65	
ET Certificate Enrollment	2	1	0	*	na	
Related AS Degree Enrollment	101	57	19	* *	na	
	C 109	C 114	122	110	na 95	
	100	114	123	113	60	
Hillsborough Community College (HCC) Adopted ET 2008						
ET AS Degree Enrollment	73	105	130	155	143	
E l Certificate Enrollment	11	11	0	none reported	13	
Related AS Degree Enrollment	201	168	130	294	171	
Related Certificate Enrollment	39	35	65	97	108	
					282	
Lake Sumter State College Adopted El 2015		unt romanta d			4-7	
ET AS Degree Enrollment	not	yet reported			47	
Related AS Degree Enrollment			21	27	13	
Related Certificate Enrollment			34	37	21	
Total	0	0	0	0	258	

Appendix page 2 of 3

College Name and Enrollment Type continued	2011-12	2012-13	2013-14	2014-15	2015-16
Northwest Florida State College (NWFSC) Adopted ET 2012					
ET AS Degree Enrollment	67	72	135	135	141
ET Certificate Enrollment	7	0	29	29	na
Related AS Degree Enrollment	96	74	83	83	38
Related Certificate Enrollment	2	0	*	*	na
Total	172	146	247	247	179
Palm Beach State College (PBSC) Adopted ET 2015					
ET AS Degree Enrollment				33	113
ET Certificate Enrollment				none reported	na
Related AS Degree Enrollment			156	149	120
Related Certificate Enrollment				none reported	13
Total	182	158	156	182	246
Pasco-Hernando State College (PHSC) Adopted ET 2015					
ET AS Degree Enrollment				44	74
ET Certificate Enrollment				*	na
Related AS Degree Enrollment			63	61	63
Related Certificate Enrollment				*	na
Total	65	64	63	105	137
Pensacola State College (PSC) Adopted ET 2008				100	
ET AS Degree Enrollment	75	77	78	69	72
ET Certificate Enrollment	14	12	0	0	na
Related AS Degree Enrollment	180	164	92	72	79
Related Certificate Enrollment	6	6	0	0	0
Total	275	259	170	141	151
Polk State College (PSC) Adopted ET 2009					
ET AS Degree Enrollment	118	168	165	140	143
ET Certificate Enrollment		0	0	*	17
Related AS Degree Enrollment	19	19	0	84	na
Related Certificate Enrollment		0	0	*	53
Total	132	78	80	93	112
State College of Florida Manatee-Venice (SCF) Adopted ET 2009					
ET AS Degree Enrollment	148	146	145	122	89
ET Certificate Enrollment		1	2	0	na
Related AS Degree Enrollment	23	6	3		na
Related Certificate Enrollment			4	0	*
Total	171	153	154	122	89
Seminole State College (SSC) Adopted ET 2014					
ET AS Degree Enrollment					24
El Certificate Enrollment			07		na
Related AS Degree Enrollment			37	28	154
Total			56	78	214
South Florida State College (SFSC) - added					
ET AS Degree Enrollment					na
ET Certificate Enrollment					na
Related AS Degree Enrollment					na
Related Certificate Enrollment					17
Total					11
St. Petersburg College (SPC) Adopted ET 2008	160	102	224	265	259
ET AS Degree Enrollment	32	46	66	203	200 98
Polotod AS Degree Enrollment	02	94	75	74	151
Related Certificate Enrollment		04	/5	/4	101 na
Total	292	313	362	434	507
Tallahassee Community College (TCC) Adopted ET 2011					
ET AS Degree Enrollment			18	47	55
ET Certificate Enrollment	4	1	5	0	na
Related AS Degree Enrollment	150	128	74	26	19
Total	151	8 137	5	73	13
Valencia	101	107	04	75	07
ET AS Degree Enrollment					na
ET Certificate Enrollment					10
Related AS Degree Enrollment					489
Related Certificate Enrollment	76-	705	74.5		164
TOTAL	(52)	(63)	(30)	795	663

MANUFACTURING DAY 2017 REPORT ON STUDENT TOURS

MFG DAY is a national outreach effort sponsored by manufacturing organizations to promote manufacturing career pathways and opportunities. It was established in 2012 and has grown every year Starting in 2013 and in connection with the national engagement efforts, the Florida Advanced Technological Center of Excellence (FLATE) has facilitated 677 students tours impacting 20,143 students and 1,229 educators who visited 600 manufacturing companies across the state of Florida. Companies from fifty of Florida's sixty-seven counties participated at least once. Forty-four percent of the students visiting facilities returned a student survey about their experience on a MFG DAY Florida tour. This report consists of a 5-year data summary, a summary of all the student tour survey responses from the 2017 tours, break out student tour survey responses for those regions that held student tours and participated in the survey, and some sample student comments.

Individual student comments from students are most commonly about the high tech machines, how they work and "assembly lines". They also positively comment abpit work was hands-on and fast paced. Other Other comments included learning about the importance of manufacturing, great tour guides, and interesting and "high tech" careers possibilities.

FLATE has also separately surveys educators/chaperons and company hosting tours about their experiences. Educators continue to rate the tours as excellent experiences both for themselves and for their students. 100% of the industry tour hosts say that the tours are worth their time and investment and find the tours also help to build camaraderie in their workforce from the front office to the loading docks.

We look forward to working with companies, schools and organizations in Florida this fall to provide student tours of manufacturing facilities. Please don't hesitate to contact us if you have any questions about the data reported in this document.

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2013-2017 Florida MFG Day Industry Tours Summary Data



> 2017	2013	2014	2015	2016	2017
Counties	23	39	50	32	32
Students	2,307	3,150	4,770	4,846	5,070 (include virtual tours)
Teachers	110	174	318	268	359
Parents/chaperon	66	113	318	217	120
Student Tours	72	95	159	186	165 (include virtual tours)
Student Surveys	1,286	1,496	2,076	1,764	2,202
Manuf Employees	225	350	636	569	515
In-kind & cash	>\$30K	>\$50K	>\$145K	>\$176K	>\$800K

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Florida MFG DAY 2017 Student Survey Data								
Student Industry Tour Date: October								
Counties: Broward, Hernando, Hillsborough, Manatee, Marion, NorthWest Florida, Orange, Pasco, Polk, Pinellas, Sarasota								
		Sur	veyed Stu	udents:	2,202			
	Yes	Yes	No Girls	No	Total	Total		
Post Tour Survey Questions	Girls	Boys	s Bo		Yes	No		
1. I was considering a career in advanced manufacturing before the tour.	109	559	601	929	668	1530		
2. My teachers have talked about advanced manufacturing with my class.	370	1053	336	436	1423	772		
3. Today I learned about technologies used in advanced manufacturing industries and manufactured products.	672	1403	38	87	2075	125		
4. This tour gave me new information about careers in advanced manufacturing.	653	1386	56	103	2039	159		
5. The tour helped me understand how STEM subjects (science, technology, engineering and math) are put to work in	635	1310	73	180	1945	253		
6. I would recommend that other students have the opportunity of this tour.	609	1340	101	148	1949	249		
7. I am now considering a career in advanced manufacturing.	211	905	501	580	1116	1081		
Total Responses	3,634	7,278	1,856	2,382	10,912	4,238		
Advanced Manufacturing Perception Impact - Question Comparison for 1	. & 7.							
93.58% Change for girls considering a career in advanced manufacturing before and after the tour.								
61.90% Change for boys considering a career in advanced manufacturing before and after the tour. (More boys considered this career before the tour.)								
67.07% Change for both boys & girls considering a career in advanced manufacturing before and after the tour.								

Surveyed Students	Male	1490	Female	712	TOTAL	2,202	I	
Ethnicity	Asian	Black	Hispanic	White	Other	nr	T	
Linneny	83	271	588	653	78	529	İ	
Grade	6th	7th	8th	9th	10th	11th	12th	nr
	56	103	132	198	218	477	269	749
Statewide Total Student Surveys	Collected Statewide (L	Data does not i	nclude virtual to	urs):			2,202	

Total students-virtual tours:

365

nr: not reported







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MFG DAY 2017 Survey Data						
Student Industry Tour Date: Octobe	er					
Tour Site Locations: AME Solutions, Hoerbiger	Corporatio	n				
County: Broward						
Name of the schools participating: Atlantic Tech	hnical Colle	ge				
Post Tour Survey Questions	Female	Yes Male	No Female	Male	Total Yes	Total No
1. I was considering a career in advanced manufacturing before the tour.	0	10	2	2	10	4
2. My teachers have talked about advanced manufacturing with my class.	2	11	0	1	13	1
3. Today I learned about technologies used in advanced manufacturing industries and manufactured	2	10	0	2	12	2
4. This tour gave me new information about careers in advanced manufacturing.	2	11	0	1	13	1
5. The tour helped me understand how STEM subjects (science, technology, engineering and math) are	2	9	0	3	11	3
6. I would recommend that other students have the opportunity of this tour.	2	10	0	2	12	2
7. I am now considering a career in advanced manufacturing.	0	11	2	1	11	3
Total Responses	10	72	4	12	82	16
Advanced Manufacturing Perception Impact - Question	Compariso	n for 1. & 7.				
0.00% Change for female considering a career in advanced manufacturing before and after the tou	r.					

14

10.00% Change for male considering a career in advanced manufacturing before and after the tour.

10.00% Change for both male & female considering a career in advanced manufacturing before and after the tour.

Surveyed Students Male: 12 Female: 2 Total

Ethnicity:

Asian:	Black:	Hispanic:	White:	Other:
0	5	2	0	0

6th	7th	8th	9th	10th	11th	12th
0	0	0	0	0	0	5







MFG DAY 2017 Survey Data						
Student Industry Tour Date: Octobe	er					
Tour Site Locations: Alumi-Guard, Accuform, Cemex, Amskills, Qorvo, ICT	C, Intrepid,	Sparton, A	merican Avi	ation		
County: Hernando						
Name of the schools participating: Hernando HS, Nature Coast Tech., Centr	al HS, Sprin	ngstead HS,	Weeki Wac	hee HS		
Post Tour Survey Questions	Yes Female	Yes Male	No Female	No Male	Total Yes	Total No
1. I was considering a career in advanced manufacturing before the tour.	17	91	226	253	108	479
2. My teachers have talked about advanced manufacturing with my class.	99	189	144	156	288	300
3. Today I learned about technologies used in advanced manufacturing industries and manufactured	211	306	32	39	517	71
4. This tour gave me new information about careers in advanced manufacturing.	201	292	42	53	493	95
5. The tour helped me understand how STEM subjects (science, technology, engineering and math) are	192	274	51	71	466	122
6. I would recommend that other students have the opportunity of this tour.	162	250	81	94	412	175
7. I am now considering a career in advanced manufacturing.	40	140	203	202	180	405
Total Responses	922	1542	779	868	2464	1647
Advanced Manufacturing Perception Impact - Question	Comparisor	n for 1. & 7.				
135.29% Change for female considering a career in advanced manufacturing before and after the tour	r.					

53.85% Change for male considering a career in advanced manufacturing before and after the tour.

66.67% Change for both male & female considering a career in advanced manufacturing before and after the tour.

Surveyed Students

Male:

345 Female: 243 Total 588

Ethnicity:

Asian:	Black:	Hispanic:	White:	Other:
6	14	71	62	3

6th	7th	8th	9th	10th	11th	12th
0	0	0	33	30	48	22







Student Industry Tour Date: October

Tour Site Locations: Pro-Tools, SMT, EMS INC., Signstar, LidWorks, Mettler Toleda Safeline, Sypris Electronics, HeatPipe Technologies

County: Hillsborough

Name of the schools participating: Buchanan MS, Tampa Bay Tech, Marshall MS, Greco MS, Young Middle Magnet School, Monroe MS, Gaither HS, King HS, Madison MS, Middleton HS, Armwood HS, Webb MS

Post Tour Survey Questions	Yes Female	Yes Male	No Female	No Male	Total Yes	Total No
1. I was considering a career in advanced manufacturing before the tour.	10	36	41	64	46	105
2. My teachers have talked about advanced manufacturing with my class.	44	91	7	9	135	16
3. Today I learned about technologies used in advanced manufacturing industries and manufactured	49	95	2	5	144	7
4. This tour gave me new information about careers in advanced manufacturing.	49	90	2	10	139	12
5. The tour helped me understand how STEM subjects (science, technology, engineering and math) are	48	92	3	8	140	11
6. I would recommend that other students have the opportunity of this tour.	43	94	8	6	137	14
7. I am now considering a career in advanced manufacturing.	15	65	36	35	80	71
Total Responses	258	563	99	137	821	236
Advanced Manufacturing Perception Impact - Question Comparison for 1. & 7.						

50.00% Change for female considering a career in advanced manufacturing before and after the tour.

80.56% Change for male considering a career in advanced manufacturing before and after the tour.

73.91% Change for both male & female considering a career in advanced manufacturing before and after the tour.

Surveyed Students	Male:	100	Female:	51	Total	151	
Ethnicity:	Asian [.]	Black:	Hispanic:	White:	Other [.]		
	16	56	72	33	6		
Grade:	6th	7th	8th	9th	10th	11th	12th
	0	47	41	12	34	3	5







Student Industry Tour Date: October

Tour Site Locations: RND Automation, Intertape Polymer Group, Teakdecking Systems, Sun Graphics, Veethree Electronics, New England Machinery

County: Manatee

Name of the schools participating: Braden River HS, Southeast HS, Manatee HS, Palmetto HS, Johnson MS, Lakewood Ranch HS

Post Tour Survey Questions	Yes Girls	Yes Boys	No Girls	No Boys	Total Yes	Total No
1. I was considering a career in advanced manufacturing before the tour.	3	12	8	15	15	23
2. My teachers have talked about advanced manufacturing with my class.	10	22	1	5	32	6
3. Today I learned about technologies used in advanced manufacturing industries and manufactured	11	27	0	0	38	0
4. This tour gave me new information about careers in advanced manufacturing.	11	27	0	0	38	0
5. The tour helped me understand how STEM subjects (science, technology, engineering and math) are	11	25	0	2	36	2
6. I would recommend that other students have the opportunity of this tour.	11	27	0	0	38	0
7. I am now considering a career in advanced manufacturing.	4	18	7	9	22	16
Total Responses	61	158	16	31	219	47
Advanced Manufacturing Perception Impact - Question	Comparison	n for 1. & 7.				

33.33% Change for girls considering a career in advanced manufacturing before and after the tour.

50.00% Change for boys considering a career in advanced manufacturing before and after the tour.

46.67% Change for both boys & girls considering a career in advanced manufacturing before and after the tour.

Surveyed	Students
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Male:

27 Female: 11 Total 38

Ethnicity:

Asian:	Black:	Hispanic:	White:	Other:
12	4	11	16	0

6th	7th	8th	9th	10th	11th	12th
5	9	8	0	1	11	3







Student Industry Tour Date: October

Tour Site Locations: SPX, DimensionWorks, Artemis Plastics, Custom Windows, Townley Engineering & Manufacturing Co., ClosetMaid Corp., Cardinal LG Co., Hale Products Inc., Cheney Brothers, Admiral Furniture, Raney's, R & L Carriers, American Panel Corporation, Winco MFG LLC, FedEx, USA Scientific, Signature Brands **County: Marion**

Name of the schools participating: Marion Tech, West Port HS, Belleview HS, Lake Weir HS, Dunnellon HS, Forest HS, Vanguard HS, North Marion HS

Post Tour Survey Questions	Yes Female	Yes Male	No Female	No Male	Total Yes	Total No						
1. I was considering a career in advanced manufacturing before the tour.	10	21	112	71	31	183						
2. My teachers have talked about advanced manufacturing with my class.	34	49	88	43	83	131						
3. Today I learned about technologies used in advanced manufacturing industries and manufactured	122	92	0	0	214	0						
4. This tour gave me new information about careers in advanced manufacturing.	121	92	1	0	213	1						
5. The tour helped me understand how STEM subjects (science, technology, engineering and math) are	119	89	3	3	208	6						
6. I would recommend that other students have the opportunity of this tour.	120	91	2	1	211	3						
7. I am now considering a career in advanced manufacturing.	33	59	89	33	92	122						
Total Responses	559	493	295	151	1052	446						
Advanced Manufacturing Perception Impact - Question	Advanced Manufacturing Perception Impact - Question Comparison for 1. & 7.											

230.00% Change for female considering a career in advanced manufacturing before and after the tour.

180.95% Change for male considering a career in advanced manufacturing before and after the tour.

196.77% Change for both male & female considering a career in advanced manufacturing before and after the tour.

Surveyed Students

Male:

92

Female: 122 Total 214

Ethnicity:

Asian:	Black:	Hispanic:	White:	Other:
5	54	91	88	8

1	Cth	741	044	044	4046	4446	4046
	otn	/tn	8ព	9th	10th	11th	1 2 th
	0	0	0	14	0	203	4







Student Industry Tour Date: October

Tour Site Locations: American Elite Molding, Ascend, GE, Gulf Power, Eastman, Ft Walton Machining, MERRICK, Manown, Rex Lumber, ExxonMobil, Maritech, West Point, Certified Manufacturing, Gelato, DRS, Strand Core, IAN-Conrad Bergan, Custom Production, Enviva, Xtreme Boats, Cerex, Oren, Cape Horn, Precision Metal, Hitachi, Pegasus Laboratories, Avalex, Artistic StoneWorks, L3, GCSC, PSC, Chipola, NWFSC, Whitlam Group

County: Northwest Florida

Name of the schools participating: Chipley HS, Milton HS, Freeport HS, Niceville HS, Crestview HS, Shoal River MS, W. C. Pryor MS, Marianna HS, Enterprise HS

Post Tour Survey Questions	Yes Female	Yes Male	No Female	No Male	Total Yes	Total No					
1. I was considering a career in advanced manufacturing before the tour.	19	88	21	64	107	85					
2. My teachers have talked about advanced manufacturing with my class.	37	139	3	12	176	15					
3. Today I learned about technologies used in advanced manufacturing industries and manufactured	38	139	2	13	177	15					
4. This tour gave me new information about careers in advanced manufacturing.	38	145	1	6	183	7					
5. The tour helped me understand how STEM subjects (science, technology, engineering and math) are	39	127	1	25	166	26					
6. I would recommend that other students have the opportunity of this tour.	37	144	3	7	181	10					
7. I am now considering a career in advanced manufacturing.	23	106	17	45	129	62					
Total Responses	231	888	48	172	1119	220					
Advanced Manufacturing Perception Impact - Question Comparison for 1. & 7.											

192

21.05% Change for female considering a career in advanced manufacturing before and after the tour.

20.45% Change for male considering a career in advanced manufacturing before and after the tour.

20.56% Change for both male & female considering a career in advanced manufacturing before and after the tour.

Surveyed Students

Male:

152

Female: 40 Total

Ethnicity:

Asian:	Black:	Hispanic:	White:	Other:
13	31	30	149	0

6th	7th	8th	9th	10th	10th 11th	
2	14	51	31	40	29	23







MFG DAY 2017 Survey Data Student Industry Tour Date: October **Tour Site Locations: Nautique Boat Company** County: Orange Name of the schools participating: Timber Creek High School, Cypress Creek High School Yes Girls Yes Boys No Girls **Total Yes** Total No Post Tour Survey Questions No Boys 1. I was considering a career in advanced manufacturing before the tour. 2. My teachers have talked about advanced manufacturing with my class. 3. Today I learned about technologies used in advanced manufacturing industries and manufactured 4. This tour gave me new information about careers in advanced manufacturing. 5. The tour helped me understand how STEM subjects (science, technology, engineering and math) are 6. I would recommend that other students have the opportunity of this tour. 7. I am now considering a career in advanced manufacturing. **Total Responses** Advanced Manufacturing Perception Impact - Question Comparison for 1. & 7. 100.00% Change for girls considering a career in advanced manufacturing before and after the tour.

14.29% Change for boys considering a career in advanced manufacturing before and after the tour.

40.00% Change for both boys & girls considering a career in advanced manufacturing before and after the tour.

Surveyed Students	Male:
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27 Female: 17 Total 44

Ethnicity:

Asian:	Black:	Hispanic:	White:	Other:	
2	16	21	8	2	

6th	7th	8th	9th	10th	11th	12th
0	0	0	0	9	17	15







MFG DAY 2017 Survey Data										
Student Industry Tour Date: Octobe	er									
Tour Site Locations: Amskills, Bay-Tech Industries, Pharmaworks, Oldcastle Coastal, Clark Dietrich, Nestle Waters, Hans, Manitowac Food, Pall Aeropower Corp, Welbilt										
Leggett & Platt, TRU Simulation & Training Inc., Facts Engineering, G	ETS USA, A	rete, Big Sto	rm Brewing							
County: Pasco										
Name of the schools participating: River Ridge HS, Zephyrhills HS, Gulf HS, Sunlake	HS, Pasco H	S, Ridgewoo	od HS, James	Irvin Educ	ation					
		-								
	Yes			No						
Post Tour Survey Questions	Female	Yes Male	No Female	Male	Total Yes	I otal No				
1. I was considering a career in advanced manufacturing before the tour.	18	108	80	162	126	242				
2. My teachers have talked about advanced manufacturing with my class.	52	153	46	117	205	163				
3. Today I learned about technologies used in advanced manufacturing industries and manufactured	98	254	0	16	352	16				
4. This tour gave me new information about careers in advanced manufacturing.	93	261	5	9	354	14				
5. The tour helped me understand how STEM subjects (science, technology, engineering and math) are	94	245	4	25	339	29				
6. I would recommend that other students have the opportunity of this tour.	96	250	2	20	346	22				
7. I am now considering a career in advanced manufacturing.	31	175	66	95	206	161				
Total Responses	482	1446	203	444	1928	647				
Advanced Manufacturing Perception Impact - Question	Compariso	n for 1. & 7.								
72.22% Change for female considering a career in advanced manufacturing before and after the tou	r.									
C2.042/ Change for much and it air a second in a transformer of a train to the form and after the term										

62.04% Change for male considering a career in advanced manufacturing before and after the tour.

63.49% Change for both male & female considering a career in advanced manufacturing before and after the tour.

Surveyed Students	Male:	270	Female:	98	Total	368
Ethnicity:	Asian:	Black:	Hispanic:	White:	Other:	
	3	22	53	97	43	
Grade:	6th	7th	04h	Oth	10th	11th

6th	7th	8th	9th	10th	11th	12t
0	0	0	53	25	67	60
						-







Student Industry Tour Date: October

Tour Site Locations: Hydro-Dyne Engineering Inc, Bausch & Lomb, H & S Swansons, Monin, ConMed, BELAC, AMETEK, Mastercut Tools, Mill-Rite Wood Working

County: Pinellas

Name of the schools participating: Countryside HS, Largo HS, East Lake HS, Osceola MS, Azalea MS, Boca Ciega HS, Dunedin HS, CAS, Seminole Middle

Post Tour Survey Questions	Yes Girls	Yes Boys	No Girls	No Boys	Total Yes	Total No
1. I was considering a career in advanced manufacturing before the tour.	3	14	10	32	17	42
2. My teachers have talked about advanced manufacturing with my class.	10	33	3	13	43	16
3. Today I learned about technologies used in advanced manufacturing industries and manufactured	13	45	0	1	58	1
4. This tour gave me new information about careers in advanced manufacturing.	13	44	0	2	57	2
5. The tour helped me understand how STEM subjects (science, technology, engineering and math) are	12	42	1	4	54	5
6. I would recommend that other students have the opportunity of this tour.	13	45	0	1	58	1
7. I am now considering a career in advanced manufacturing.	10	36	3	10	46	13
Total Responses	74	259	17	63	333	80
Advanced Manufacturing Perception Impact - Question	Comparison	for 1. & 7.				

233.33% Change for girls considering a career in advanced manufacturing before and after the tour.

157.14% Change for boys considering a career in advanced manufacturing before and after the tour.

170.59% Change for both boys & girls considering a career in advanced manufacturing before and after the tour.

Surveyed Students

Male:

46 **Female:** 13 **Total 59**

Ethnicity:

Asian:	Black:	Hispanic:	White:	Other:
4	10	29	18	3

6th	7th	8th	9th	10th	11th	12th
31	7	3	3	8	4	0







Student Industry Tour Date: October

Tour Site Locations: Pepperidge Farm, Florida's Natural Growers, Kegel Inc., ITW Professional, JC Machine, Coca-Cola, MaxPak, Sofidel America, Key Safety Inc., Givaudan Flavors Corp., PCA-Packaging Corp. of America, Pepperidge Farms, MidState Machine & Fabricating

County: Polk

Name of the schools participating: Bartow HS, Lake Region HS, Lake Wales HS, McKeel Academy, Frostproof HS, Ridge Community HS, Kathleen HS, Traviss Tech. College, Fort Meade HS, Ridge Tech. College, George Jenkins HS, Mulberry HS, Tenoroc HS, Winter Haven HS, Central Florida Aerospace Academy

Post Tour Survey Questions	Yes Female	Yes Male	No Female	No Male	Total Yes	Total No
1. I was considering a career in advanced manufacturing before the tour.	6	52	41	118	58	159
2. My teachers have talked about advanced manufacturing with my class.	21	132	22	39	153	61
3. Today I learned about technologies used in advanced manufacturing industries and manufactured	46	169	1	2	215	3
4. This tour gave me new information about careers in advanced manufacturing.	46	166	1	5	212	6
5. The tour helped me understand how STEM subjects (science, technology, engineering and math) are	44	159	1	12	203	13
6. I would recommend that other students have the opportunity of this tour.	47	168	0	3	215	3
7. I am now considering a career in advanced manufacturing.	22	113	28	57	135	85
Total Responses	232	959	94	236	1191	330
Advanced Manufacturing Perception Impact - Question	Compariso	n for 1. & 7.				

266.67% Change for female considering a career in advanced manufacturing before and after the tour.

117.31% Change for male considering a career in advanced manufacturing before and after the tour.

132.76% Change for both male & female considering a career in advanced manufacturing before and after the tour.

Surveyed Students

Male:

Α

171 Female: 50 Total 221

Ethnicity:

sian:	Black:	Hispanic:	White:	Other:
7	28	101	72	3

6th	7th	8th	9th	10th	11th	12th
0	0	0	14	26	56	88







MFG DAY 2017 Survey Data Student Industry Tour Date: October Tour Site Locations: KHS USA, INC, Sun Hydraulics, Sun Coast Technical College, PGT Industries, Super Sensitive Musical Strings, Harn R/O Systems, Mullet's Aluminum **Products, Adams Group County: Sarasota** Name of the schools participating: Brookside MS, Booker MS, Sarasota MS, McIntosh MS, Laurel Nokomis, Woodland MS, Sarasota HS, Booker HS, Suncoast Poly Tech HS, Riverview HS, Pine View HS, North Port HS, Venice HS, Venice MS, Heron Creek MS Total Yes No Girls Post Tour Survey Questions Yes Girls Yes Bovs No Boys Total No 1. I was considering a career in advanced manufacturing before the tour. 2. My teachers have talked about advanced manufacturing with my class. 3. Today I learned about technologies used in advanced manufacturing industries and manufactured 4. This tour gave me new information about careers in advanced manufacturing. 5. The tour helped me understand how STEM subjects (science, technology, engineering and math) are 6. I would recommend that other students have the opportunity of this tour. 7. I am now considering a career in advanced manufacturing. **Total Responses** Advanced Manufacturing Perception Impact - Question Comparison for 1. & 7. 35.00% Change for girls considering a career in advanced manufacturing before and after the tour.

45.00% Change for boys considering a career in advanced manufacturing before and after the tour.

43.57% Change for both boys & girls considering a career in advanced manufacturing before and after the tour.

Surveyed Students	Male:	248	Female:	66	Total	314

Ethnicity:

Asian:	Black:	Hispanic:	White:	Other:
15	31	107	110	10

6th	7th	8th	9th	10th	11th	12th
18	26	29	38	45	39	44

2017 Manufacturing Day Industry Tour, Students' Comments to

"What did you like most about this tour?"

- "I enjoy being able to watch exactly how you go through the process. Being able to really helped me grasp the concept"
- "I Love the robotics and the people who gave us the tour"
- "The robotics and how they make the bits and tools. I would like more tours like this"
- "The labeling of computers. The tour was one of the best opportunities that I've had"
- "I really like the interactive portions of the tour letting me use the saw. I also like the software and how one of the engineer made a program to help with his job"
- "I like learning how they test the material. The testing is very efficient and I learned a lot!"
- "Great tour, great job positions"
- "Cool to see how many bottles they use a day and seeing if the if the syrup is good"
- "I really liked about this tour is the bottles getting packaged. I also like how the people worked the machines"
- "One thing I liked was the inspection because we see how the inspection machine works. Another thing I like was the career options"
- "Being able to see how each machine is used, and how each person manning the machines work together. My favorite machine had to be the inspecting tool"
- "I like when they showed us the cutter. I also like the way they measured the metal design"
- "I like how he explained everything very thoroughly and he made it easy to understand"
- "I like to see the plastic sheet rolling off the contraption also at first when I saw the plastic being molded through, then raise up"
- "To see the process of making the lids, how they go from the small pallets to a lid"
- "I like learning how many boxes they make a day. It is really cool how they reuse the plastic leftover"

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FLATE Community of Practice (2017 Update)

Organizational Partners

.decimal – Supported MFG Day outreach A&N (Levy) – Supported MFG Day **ABB, Inc.** – Supported MFG Day **ABCO Transport**– Supported MFG Day AbleTrust – In-kind Support; Facility has partnered with the center on outreach activities and student tours, MFG Day support Accuform – Supported MFG Day outreach **ACR Electronics**– Supported MFG Day Adams Air & Hydraulics- Sponsored ET Forum **Adams Group** AdamsArms – Supported MFG Day Admiral Furniture – Supported MFG Day **ADS** – Supported MFG Day **Aerojet Rocketdyne** – Facilities; In-kind Support; Collaborative Research Serves on NVC and partners with the center on outreach, curriculum development activities and student tours, MFG Day support **Aerosonic Corporation** – In-kind Support: Facility has partnered with the center on outreach activities and student tours, Manufacturing Day support **Aeroturbine, Inc**. – In-kind Support: Facility has partnered with the center on outreach activities and student tours, Manufacturing Day support Agilent Technologies - Collaborative Research Partnered with the center on outreach activities and supports curriculum development activities ALCOA Alumi-Guard – Supported MFG Day outreach AMATROL - In-kind Support; Collaborative Research, Partnered with the center on outreach activities and supports curriculum development activities Amazon Hose & Rubber – Supported MFG Day **Ambrose Gormley, Inc.** – Supported MFG Day **American Aviation** American Elite Molding – Supported MFG Day **American Panel Corporation** American Samoa Community College – PATHTECH Collaborator **American Society of Transportation and Logistics** American Society Quality (ASQ) – Supported MFG Day **AME Solutions** AMETEK – Supported MFG Day Conmed Tool & Mold – Supported MFG Day





Amskills – Supported MFG Day Amskills (Marchman Technical College) - Supported MFG Day **APICS Florida West** – Supported MFG Day Arete **ARM** (Advanced Robotics for Manufacturing Institute) **Artemis Plastics Arther Manufacturing** Arthur Machinery – MFG Day support Artistic StoneWorks Artix – Supported MFG Day Ascend – Supported MFG Day Asbell Business Bldg. Ashland Technologies – Supported MFG Day **Ashley Homestores** Asheville-Buncombe Technical Community College – PATHTECH Collaborator ASO LLC (SunCoast Tech College) – Supported MFG Day **ASPE Training Athan Engineering** Atlantic Technical Center(ATC) – Supported MFG Day **Automation Personnel Services, Inc** AYES Azure Water – Supported MFG Day Baker College - PATHTECH Collaborator **BAE Systems (Jacksonville)** - MFG Day support **Ball Corporation** – MFG Day support **Bausch & Lomb** – Supported MFG Day **Baxter Healthcare Corporation** Bay Area Manufacturers Association – Supported MFG Day; Supported Summer Camps **Bay County Okaloosa Walton** – Supported MFG Day Bay State Cable Ties - MFG Day support **Bay-Tech Industries** – Supported MFG Day **Beckwith Electric** – MFG Day support Belac - MFG Day support Bellingham Technical College - PATHTECH Collaborator **Big Storm Brewing Black Diamond Strings** Bluegrass Educational Technologies - Supported MFG Day; Sponsor for ET Forum **Bob's Space Racers** – MFG Day support **Boston Whaler** – MFG Day support Bradenton Area Economic Development Corp.





Brevard County Public Schools, Florida - Facilities; Collaborative Research Partner participating in curriculum reform and outreach activities, MFG Day support Broward College – Facilities; ET Forum; Collaborative Research Partner College participating in curriculum reform activities and professional development **Brustain & Manasevit** Bryant and Stratton College - PATHTECH Collaborator **BrvCoat** CAMLS **Campbell Management Services** Capital Region Manufacturers Assoc. – Financial Support; In-kind Support; Collaborative Research; Regional Manufacturing Association partnering in center activities; MFG Day support **CaptiveAire** – Supported MFG Day Cardinal Glass – Supported MFG Day **Cardio Command Career Source Florida** – In-kind Support; Collaborative Research Partnered with the center on outreach and curriculum development activities, V.P. serves on Center's NVC, MFG Day support **Career Source Tampa Bay** – In-kind Support; Collaborative Research Partnered with the center on distribution of outreach materials and collaborated on curriculum development activities, MFG Day support **Caribbean Crusin Carlisle IT** – MFG Day support **Carollo Engineers Carver Center Causey Machine Works, Inc Cavaform** – MFG Day support Cavanaugh – Black Diamond Guitar Strings – Supported MFG Day CDS (Commercial Design Services) **Cemex** – Supported MFG Day Central Carolina Community College - PATHTECH Collaborator Central Carolina Technical College - PATHTECH Collaborator Central Community College - PATHTECH Collaborator Central Florida Box – Supported MFG Day Central Maine Community College - PATHTECH Collaborator Central Oregon Community College - PATHTECH Collaborator **CEREX** – Supported MFG Day Certified Manufacturing - Supported MFG Day **Cheney Brother's** CHICK Chipola State College – Facilities; ET Forum; Collaborative Research Partner College participating in curriculum reform activities and professional development; PATHTECH Collaborator **Chris-Craft Chromalloy Castings** – Supported MFG Day Cincinnati State Technical and Community College - PATHTECH Collaborator **Citizen Energy**





City College of San Francisco - PATHTECH Collaborator **City of Leesburg Electric Department** City of Ocala Utilities - Supported MFG Day **Clark Dietrich** – Supported MFG Day Clarkwestern **Closet Maid** – Supported MFG Day **Clover Park Technical College - PATHTECH Collaborator** Coastal Caisson Corp. – In-kind Support; Facilities; Collaborative Research Facility has partnered with the center on outreach activities and student tours, Manufacturing Day support Coca-Cola – Supported MFG Day College of Central Florida- Supported MFG Day; ET Forum, PATHTECH Collaborator **College of Lake County -** PATHTECH Collaborator College of the Marshall Islands - PATHTECH Collaborator **Collins Manufacturing, Inc.** Columbia Gorge Community College - PATHTECH Collaborator Columbia State Community College - PATHTECH Collaborator Columbus State Community College - PATHTECH Collaborator **Combs Welding Design, Inc.** – In-kind Support Facility has partnered with center in creating a Virtual Tour of their operations Comex **Community College Consulting Group, Inc.** Community College of Allegheny County - PATHTECH Collaborator **Composite Building Structures, Ltd.** Compulink **Concord Consortium** Conmed Corp. - Supported MFG Day; Sponsored FLATE awards; Collaborative Research Personnel serve on the center's advisory board **Conmed Linvatec** CORD Craig Technologies – Supported MFG Day **Cross Border Partners Advisory Services Custom Victory Metal Designs** – Supported MFG Day **Custom Windows** Cutrale - Supported MFG Day Cuyamaca College - PATHTECH Collaborator Cuyahoga Community College- PATHTECH Collaborator **Data Graphics** – Supported MFG Day **Davtona State College** – ET Forum: Partner College participating in curriculum reform activities and outreach DCPS **Decimal Engineering** De Lorenzo USA





Del Mar College - PATHTECH Collaborator Delaware Technical Community College - PATHTECH Collaborator **Denmark Group, Ink Dentsply** – Supported MFG Day **Designs for the World LLC Digital Manufacturing & Design Innocation Institute Digital World Biology Dimension Works** – Supported MFG Day Ditek - In-kind Support; Collaborative Research, Industry partner, participating in curriculum reform **DiverseArts** DMG MORI - Supported MFG Day and outreach **Doble Engineering Draper Laboratory** DRS Technologies- Supported MFG Day **Dunia Stores General Trading & Contracting Company Duval County Schools (Peterson Academy)** – MFG Day support **Dynamic Energy Partners** Eastern Florida State College – Facilities; ET Forum; Collaborative Research Partner Community College, participating in curriculum reform activities **Eastern Suffolk BOCES** Eastern Iowa Community College - PATHTECH Collaborator East Lake High School - Facilities; Collaborative Research Partner participating in curriculum reform and outreach activities Eastman – Supported MFG Day **EEI Training**– Supported MFG Day Economic Development Commission: Florida's Space Coast - PD and MFG Day support Edibon Edgecombe Community College - PATHTECH Collaborator Edmonds Community College - PATHTECH Collaborator **Electron Machine** – Supported MFG Day El Paso County Community College - PATHTECH Collaborator **Embraer Executive Aircraft, Inc. Emerald Coast Motorsports** EMI Industries – In-kind Support; Collaborative Research Facility had partnered with center in creating a Virtual Tour of their operations EMS Inc- Supported MFG Day; supported summer camps and outreach Enterprise Florida - Collaborative Research, Working with the Manufacturing Advisory Council on curriculum reform and outreach activities **Environmental Consulting & Technology, Inc Enviva Exactech** – MFG Day support **Express Employment Professionals**





Exxon Mobil – MFG Day support E-One – Supported MFG Dav Fabbro **Fabco-Air** – In-kind Support; Facility has partnered with the center on outreach activities and student tours Fabricators & Manufacturers Association, Int. Facts **Fairfield Index, Inc** Fanuc Robotics America, Inc. FedEx **FESTO** Firmenich First Coast Manufacturers Association – In-kind Support; Facility partnered with the center on outreach activities; MFG Day support **Flagstone Pavers** – Supported MFG Day **Fleet Readiness Center Southeast** Florida Association for Career and Technical Education (FACTE) – Sponsor PD Florida Association for Industrial and Technical Educators (FAITE) – PD Florida Business & Manufacturing Solutions, Inc **Florida Citrus Sports** Florida Defense Contractors Association – Supported MFG Day Florida Dept. of Education – Collaborative Research Adult and Career and Technical Education Division participating in curriculum reform activities, Vice Chancellor serves on the center's NVC Florida Energy Workforce Consortium (FEWC) – Donated to MFG Day; PD Florida Gateway College – Facilities; ET Forum; Collaborative Research Partner community college participating in curriculum reform and outreach activities Florida High Tech Corridor Council – Financial Support; In-kind Support; Collaborative Research; Financially supports student industry tours and partners in outreach activities Florida Institute for Human & Machine Cognition Florida Keys Community College – Facilities; ET Forum; Collaborative Research Partner Community College, participating in curriculum reform activities Florida Medical Manufacturers Consortium, Inc. – Supported MFG Day Florida MEP Florida National Guard – Supported MFG Day Florida's Natural – In-kind Support; Facilities; Collaborative Research Florida Southwestern State College – Facilities; ET Forum; Collaborative Research Partner Community College, participating in curriculum reform activities Florida State College at Jacksonville – Facilities; ET Forum; Collaborative Research Partner Community College, participating in curriculum reform and outreach activities; PATHTECH Collaborator Florida Trade @ HCC Florida West Coast Chapter of NTD & PMA – Supported MFG Day **FMA Communications, Inc** Foothill College - PATHTECH Collaborator Fort Walton Machining Inc. – Supported MFG Day





Fox IV Technologies, Inc Fracture – MFG Day support **Frisella Design Fuchs Lubricants Co.** Fulton-Montgomery Community College - PATHTECH Collaborator Gadsden State Community College - PATHTECH Collaborator Gateway Community College - PATHTECH Collaborator **Gasco** – MFG Day support Gator Boards, (GB Sports Inc.) – MFG Day support Gainesville Area Chamber of Commerce – MFG Day support **GE** – Supported MFG Day **Gelato** – Supported MFG Day GenerationOne Gerdau (Jacksonville) - Supported MFG Day **German American Chambers of Commerce** GETS Givaudan Flavors Corp – Supported MFG Day **GLE Scrap Metal Global Business Logistix Global Dynamics, LLC** Golden Flake – Supported MFG Day **Goodheart-Willcox Goodwill Industries of SWFL Goodwill Industries of Suncoast. Inc.** Goodwin Heartpine – MFG Day support **Greater Pensacola Champer** Greco Middle School - Facilities; Collaborative Research Partner School participating in professional development and outreach activities Green and Sustainable Solutions, Inc Gulf Coast State College - Facilities; ET Forum; Collaborative Research Partner Community College, participating in curriculum reform activities; PATHTECH Collaborator **Gulf Marine Repair Corp. Gulf Power** – Supported MFG Day **Gulftect Enterprises, Inc. H&S Swanson's Tools Co.** – Supported MFG Day Haas Automation, Inc Haas Machine –MFG Day support **Haas Tower HABCO** Manufacturing Hagerstown Community College - PATHTECH Collaborator Halifac Health





Halycon Dive Systems – MFG Day support Hale – Supported MFG Day Hampden Engineering Corp. **Hanel Storage Systems** Hans Harford Community College - PATHTECH Collaborator Harn R/O Systems – Supported MFG Day Harris Corporation - Financial Support; In-kind Support; Facilities; Collaborative Research Partnered with the center on outreach activities and supports curriculum development and legislative activities, partially funded outreach activity reaching 750,000 H.S. students, MFG Day support Harry P. Curtis Honey Co. – MFG Day support Hartnell College - PATHTECH Collaborator **HCPS SSEP** Heat Pipe Technologies – Financial Support; In-kind Support; Partnered with the center on outreach activities and supports curriculum development, MFG Day support **Hexagon Metrology Highland DNC, LLC** Hillsborough Alliance – Supported MFG Day Hillsborough Community College – Facilities; ET Forum; Collaborative Research Partner Community College, participating in curriculum reform activities; PATHTECH Collaborator Hillsborough County Florida Government – Supported Summer Camps Hitachi Hoerbiger Corporation – Supported MFG Day; Sponsored FLATE Awards Hoffstetter Tool & Die, Inc Holyoke Community College - PATHTECH Collaborator Honda Manufacturing of Alabama Honeycomb Company of America – In-kind Support; Facilities; Collaborative Research Facility has partnered with the center in contributing materials for classroom training and project development Honeywell – Supported MFG Day **Hot City Wireless HPK Group LLC Hunter Panels** Hydrodyne Engineering- Supported MFG Day **Ian-Conrad Bergan ICTC** – Supported MFG Day **IBEW NETA ICF International IC Mechanical ID** Plans **iDATIX** iDesign Technology ihmc I Love Oils – Supported MFG Day





Illinois Valley Community College - PATHTECH Collaborator **Impact Lighting** Indian Hills Community College - PATHTECH Collaborator Indian River State College – Facilities; Collaborative Research Partner Community College, participating in curriculum reform activities **Industrial Galvanizers Ingalls Shipbuilding Innovation Express Innovative Links USA, INC** Integrated Systems Technology, Inc. Intelitek Intelligrated International Paper – MFG Day support **Interplex Industries** Intertape Polymer Group - Supported MFG Day **Inteva Products Intezvne Technologies Intrepid** – Supported MFG Day Itasca Community College - PATHTECH Collaborator **ITW Professional** – Supported MFG Day iVenture, Business Friendly IT **Iverson and Company** – Facilities; Collaborative Research Serves on NVC and are partners in outreach Jabil Circuit - In-kind Support; Facilities; supports outreach and curriculum development; MFG Day support Jaegar Corp. – Sponsor for ET Forum, FLATE Awards JC Machine – Supported MFG Day Johnson Controls – MFG Day support and industry tours **JPMorgan Chase Bank JRL Ventures, Inc** Kegel, Inc. – Supported MFG Day **Key Safety Inc.** KHS USA INC (SunCoast Tech College) – Supported MFG Day K-Mart Distributions - Supported MFG Day **Knights Armament** – Supported MFG Day Krausz – Supported MFG Day L3 – Supported MFG Day Lake Sumter State College - Facilities; ET Forum; Collaborative Research Partner Community College, participating in curriculum reform activities; PATHTECH Collaborator Lake Washington Institute of Technology - PATHTECH Collaborator Lakeland Community College - PATHTECH Collaborator Lakeland Electric – MFG Day support Laramie County Community College - PATHTECH Collaborator Lawson State Community College - PATHTECH Collaborator



NSE

Learnings Labs, Inc. - Supported MFG Day; Sponsor for ET Forum **LEDnovation** – In-kind Support; Facilities; Collaborative Research, Facility participates in outreach activities and curriculum reform Lee Schools – MFG Day support Leeward Community College - PATHTECH Collaborator Leggett & Platt Leslie Controls - Supported MFG Day and industry tours Lewis-Clark State College - PATHTECH Collaborator Linn-Benton Community College - PATHTECH Collaborator LidWorks – Supported MFG day Lockheed Martin – Supported MFG Day Lorain Community College - PATHTECH Collaborator Los Angeles Pierce College - PATHTECH Collaborator Made in Florida – Sponsored Summer Camps Madison Area Technical College - PATHTECH Collaborator Main Recycling – MFG Day support Manatee County Schools – MFG Day support Manatee Technical College – Supported MFG Day Manchester Community College - PATHTECH Collaborator Manitowoc Food – Supported MFG Day Manown – Supported MFG Day Manufacturers Association of Central FL – Financial Support; In-kind Support; Collaborative Research; Regional Manufacturing Association partnering in center activities; MFG Day support Manufacturers Alliance of Hillsborough County - Financial Support; In-kind Support, MFG Day support Manufacturing and Supply Chain Alliance of Mid Florida (MSCA) - Financial Support; In-kind Support; Collaborative Research, Regional Manufacturing Association partnering in center activities, MFG Day support Manufacturing Skills Standards Council (MSSC) – In kind support, Partner participating in curriculum reform Manzi Metals, Inc. – MFG Day support Marion Regional Manufacturers Association - MFG Day support Marion County Community Technical and Adult Education Center – Facilities; Collaborative Research, Partner participating in curriculum reform and outreach activities Marion Schools – Supported MFG Day Maritech – Supported MFG Day Mark Two Engineering – MFG Day support Mast Academy – Supported MFG Day Master Cut Tool Corp. – Supported MFG Day MassBav Community College - PATHTECH Collaborator MaxPak – Supported MFG Day **Measurement Supply** – Supported MFG Day Mercury Marine - Supported MFG Day Mermaid Manufacturing – Supported MFG Day





MERRICK – Supported MFG Day Metal Essence, Inc – Supported MFG Day Mettler Toleda Safeline – Supported MFG Day Miami Dade College - Facilities; Collaborative Research Partner Community College participating in curriculum reform activities Micro Matic USA, Inc. – MFG Day support Middleton High School - Facilities; Collaborative Research, outreach, professional development, and curriculum development Mid Florida Regional Manufacturers Association – Financial Support; In-kind Support; Collaborative Research; Regional Manufacturing Association partnering in center activities: MFG Day support Mid-State Machine & Fabricating Corp. – Supported MFG Day Mill-Rite Wood Working – Supported MFG Day **Mitek** – MFG Day support, Industry host for the International internship program with the **Basque Country of Spain** MITRE – In-kind Support; Facilities; Collaborative Research Partnered with the center on outreach activities and supports curriculum development activities Mitsubishi Hitachi – Supported MFG Day Modesto Junior College - PATHTECH Collaborator **Molex** – Supported MFG Day Monin – Supported MFG Day; Curriculum support Monroe Community College - PATHTECH Collaborator Monroe Middle School - Collaborative Research Partner School participating in professional development and outreach activities **MTAB USA** Mullet's Aluminum Products – Supported MFG Day Museum of Science and Industry (MOSI) – In-kind Support; Facilities; Facility has partnered with the center on outreach activities National Association of Manufacturers – Collaborative Research Collaborator and partner in outreach activities supporting manufacturing in Florida, MFG Day support National Instruments – Sponsor for ET Forum National Science Foundation – Supported summer camps Naugatuck Valley Community College - PATHTECH Collaborator Nautique Boat – Supported MFG Day; Hosted NVC **Neilsen Media** – In kind support; Hosted NVC Nestle Waters - Supported MFG Day **New England Machinery** - Supported MFG Day Nida Corp. – Sponsored ET Forum North Dakota State College of Science - PATHTECH Collaborator North Florida Community College – Facilities; ET Forum; Collaborative Research Partner Community College, participating in curriculum reform activities; PATHTECH Collaborator Northeast Iowa Community College - PATHTECH Collaborator Northeast Wisconsin Technical College - PATHTECH Collaborator Northern Marianas College - PATHTECH Collaborator Northern New Mexico College - PATHTECH Collaborator



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Northwest Florida Manufacturers Council - In-kind Support; outreach, curriculum development and student tours; MFG Day support Northwest Florida State College – Facilities; ET Forum; Collaborative Research Partner Community College, participating in curriculum reform activities NTMA Florida West Coast Chapter – Donated to MDG Day Nuts Bolts & Thingamajigs – Sponsored summer camps **Oakton Community College - PATHTECH Collaborator Octex** – In-kind Support; Facilities Partnered with the center on outreach activities and tours, MFG Day support **Odyssey Manufacturing Company** – MFG Day support **Oldcastle Coastal** – Supported MFG Day Oregon Coast Community College - PATHTECH Collaborator Pall Aeropower – In-kind Support; Facilities; curriculum reform activities Palm Beach State College - Facilities; ET Forum; Collaborative Research Partner Community College, participating in curriculum reform activities; PATHTECH Collaborator Pamlico Community College - PATHTECH Collaborator Parkland College - PATHTECH Collaborator Pasco-Hernando State College – Facilities: ET Forum: Collaborative Research Partner Community College, participating in curriculum reform activities; PATHTECH Collaborator PCA-Packaging Corp. of America – Supported MFG Day Pearson Pensacola State College - Collaborative Research; ET Forum; Curriculum reform activities; PATHTECH Collaborator **Pepperidge Farm** – Supported MFG Day Pepsico, Inc. - Financial Support; In-kind Support; outreach, curriculum development and legislative activities **PGT Industries** – Supported MFG Day **Pharmaworks** – Supported MFG Day Piedmont Virginia Community College - PATHTECH Collaborator **Pinellas County Schools** – Facilities; curriculum; outreach, MFG Day support **Polk State College** – Facilities; ET Forum; Collaborative Research; curriculum reform activities; **PATHTECH** Collaborator **Polygon Solutions** – MFG Day support Polypack, Inc. – In-kind Support; outreach, curriculum development and student tours Port of Tampa - Facilities; Collaborative Research Partnered with the center on outreach activities and supports curriculum development activities Portland Community College - PATHTECH Collaborator **POS-IMPACT, LLC** – Donated to MFG Day **Premier Reality of Tampa Production Metal Stamping Pro-Tools** – Supported MFG Day; Supported Summer Camps; Outreach activities Publix – In-kind and cash support; outreach activities; student tours, MFG Day support **Qorvo** – Supported MFG Day **R&L Truckload Services** – Supported MFG Day





Ranev's Rapid Prototyping – Supported MFG Day Raritan Valley Community College - PATHTECH Collaborator **Raytheon Corporation** – In-kind Support; Facilities; Industry partner Red Rocks Community College - PATHTECH Collaborator **Regal Marine** – Supported MFG Day **REN International** – MFG Day support **Rex Lumber** – Supported MFG Day **Rex Lumber (Graceville)** – Supported MFG Day **RND** Automation - Supported MFG Day Robinson High School - In-kind Support; Collaborative Research Facility has partnered with the center on outreach and curriculum development activities and student tours Rockford-Ettco Procunier – Supported MFG Day **Rockwell Automation Rowe Manufacturing** – Supported MFG Day Rowan College of Burlington County - PATHTECH Collaborator Rowan-Cabarrus Community College - PATHTECH Collaborator **S4J Manufacturing** – Supported MFG Day St. Petersburg College – Facilities; ET Forum; Collaborative Research Partner Community College, participating in curriculum reform activities SAAB USA **Saddle Creek Logistics** San Bernardino Valley College - PATHTECH Collaborator Santa Fe Community College - PATHTECH Collaborator Santa Monica College - PATHTECH Collaborator Sarasota County Schools Career & Technical Education - MFG Day Support Sarasota-Manatee Manufacturing Assoc. – Financial Support; In-kind Support; Collaborative Research; Regional Manufacturing Association partnering in center activities; MFG Day support Seattle Community College - PATHTECH Collaborator **School District of Hillsborough County** – In-Kind support; Financial Support; Collaborative Research; Partner participating in curriculum reform, professional development, outreach activities, and student tours, MFG Day support, Engineering Technology Experience Tours transportation and coordination support Seattle Community College - PATHTECH Collaborator SeaWay Plastics – Supported MFG Day Sebring Airport Authority – In-Kind support; Partnered with the center on outreach activities Seimens Seminol State College of Florida - Facilities; ET Forum; Collaborative Research Partner Community College, participating in curriculum reform activities **Senninger Irrigation** – Supported MFG Day Shaw Development – In-kind Support; Facilities; Collaborative Research Personnel serve on the center's advisory board, outreach and curriculum development activities Shoreline Community College - PATHTECH Collaborator





Sibex – MFG Day support Sign-age - Supported MFG Dav Signature Brands – Supported MFG Day SignStar – Supported MFG Day Sinclair Community College - PATHTECH Collaborator SMC Corporation of America - financial and kind Support; outreach and curriculum development activities SME USA (Tampa Bay) - Supported Summer Camps and outreach Smith and Nephew – Collaborative Research Industry partner, participating in curriculum reform Society of Manufacturing Engineers Chapter 159 – Supported MFG Day; PD Sofidel America – MFG Day support **SOFWERX** – Supported Summer Camps/outreach activities **Soler Palau** – MFG Day support **Solar Tech Universal** – MFG Day support Somatron – MFG Day support **Somec, Inc.** – outreach and supports curriculum development activities Southern Educational Systems - Sponsor for ET Forum South Florida Manufacturers Association - Financial and in-kind support; outreach and curriculum development activities; MFG Day support South Florida State College - Facilities; ET Forum; Collaborative Research Partner Community College, participating in curriculum reform activities Southern Manufacturing Technologies (SMT) – MFG Day support; outreach and curriculum development activities Southwest Regional Manufacturers Assoc. - Financial Support; In-kind Support; Collaborative Research; Regional Manufacturing Association partnering in center activities; MFG Day support **Sparton** – Supported MFG Day **SPX** – Supported MFG Day St. Louis Community College - PATHTECH Collaborator St. Louis Technical College - PATHTECH Collaborator St. Petersburg College - PATHTECH Collaborator **Stamas Yachts** – Supported MFG Day State College of Florida, Manatee – Facilities; ET Forum; Collaborative Research Partners in curriculum reform, professional development, and outreach activities; PATHTECH Collaborator Strand Core – Supported MFG Day **Stryker Mako** – MFG Day support Suncoast Credit Union Foundation – Supported Summer Camps Sun Graphics - Supported MFG Day Sun Hydraulics Corp. – Supported MFG Day Sunsational Citrus – Supported MFG Day Super Sensitive Musical Strings – Supported MFG Day Surge Suppression, Inc. – MFG Day support Sypris Electronics – In-kind Support; outreach curriculum development activities, MFG Day





support

Tallahassee Community College – Facilities; ET Forum; Collaborative Research Partner community college participating in curriculum reform and outreach activities, MFG Day support; PATHTECH Collaborator

Tallahassee Economic Development Committee – Collaborative Research; In-kind; Facilities Support for outreach and recruitment of students for Florida manufacturing careers

Tampa Armature Works (TAW) – In-kind Support; Facilities; outreach and curriculum development activities and student tours. MFG Day support

Tampa Bay Brewing Company – MFG Day support

Tampa Bay Steel - Supported MFG Day

Tampa Chamber of Commerce – Collaborative Research; Outreach Partner in outreach activities to the community

Tampa Port Authority - outreach; curriculum development activities and student tours

 $Teak \ Decking \ Systems - Supported \ MFG \ Day$

TEAM Applications, LLC – Supported Summer Camps

Technical Training Aids – Sponsor; Supported Summer Camps; Sponsored ET Forum

TECO – In-kind Support; Collaborative Research; Serves on Industrial Advisory Committee; supports curriculum reform and outreach activities, MFG Day and Summer Camp support

Tektronix - Sponsor for ET Forum

Teledyne Oil and Gas – MFG Day support

Tervis – Facilities; Facility has partnered with the center on outreach activities and tours, MFG Day support

Terra State Community College - PATHTECH Collaborator

 $TestEquity-Sponsored \ ET \ Forum$

The Smart Companies – Contributed to MFG Day

Three Rivers Community College - PATHTECH Collaborator

Thompson Pump – MFG Day support

Tooling U-SME – Facilities; Partnered with the center on outreach activities and supports curriculum development activities, ET Forum support

Townley – Supported MFG Day

TPR

Trenholm State Community College - PATHTECH Collaborator

Trilogy Laboratories - Supported MFG Day

TRU-Simulation

University of Central Florida– Facilities; Collaborative Research; Collaborator for outreach and curriculum reform

Upper Tampa Bay Manufacturers Association – In-kind Support; Partnered with the center on outreach activities and supports legislative activities; MFG Day support

USA Scientific

USF College of Engineering – Collaborative Research, support for curriculum development activities and student tours

USF Nanotechnology Research and Education Center (NREC) – Collaborative Research, support for curriculum development activities and student tours

USF Department of Anthropology, Sociology, and Political Science – Collaborative Research;





Personnel Exchanges; Grant proposal partners USF Research Facility - Collaborative Research, support for curriculum development activities and student tours UTC Aerospace (Jacksonville) – MFG Day support Vac-con - (Jacksonville) – MFG Day support **Vac-Tron** – Supported MFG Day Valencia State College – Facilities; Collaborative Research Partner College, participating in curriculum reform activities Valpak (Cox Target Media, Inc.) – In-kind Support; Facilities; outreach activities; student tours; MFG Day support; Supported Summer Camps **Veethree Electronics & Marine, LLC**. – MFG Day support **Ven-Tel Plastics**– In-kind Support; Facilities Facility has partnered with the center on outreach and curriculum development activities and student tours, MFG Day support Victory Tailgate – Supported MFG Day Vistakon – MFG Day support **VLOC Incorporated** – In-kind Support; outreach and curriculum development activities Volusia Manufacturers Association (VMA) – Financial Support; In-kind Support; Collaborative Research; Regional Manufacturing Association partnering in center activities **Vulcan Machine** – In-kind Support; Facilities; Partnered with the center on outreach activities; MFG Day support Waukesha County Technical College - PATHTECH Collaborator Welbilt West Coast Classic – Supported MFG Day WestPoint Home – MFG Day support Whatcom Community College - PATHTECH Collaborator Winco -- Supported MFG Day WTEC – Supported MFG Day **Xtreme Boats** Yavapai College - PATHTECH Collaborator Zodic

Collaborators & Contacts

Professional Associations: FLATE has formal and informal partnerships with many state, regional organizations for outreach, dissemination, and subject matter expertise.

- * APICS, James Moore, Chapter Chair
- * Atlantic Technical Center, Kevin Finan
- * Bay Area Mfg. Assoc., Christina Davenport, President
- * Bay Area Mfg. Assoc., Amy Snider
- * Bay Area Mfg. Assoc., Cliff Csulik
- * Capital Region Manufacturers Association, Travis Yelverton
- * CTEF, Paul Wannish, President
- * First Coast Manufacturing Assoc., Sherri Mitchell, Director
- * First Coast Manufacturing Assoc., Debbie Warren, VP of Administration



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- * Florida Assoc. of Career and Tech. Ed., Marsan Carr, Exec. Director
- * Florida Career Pathways Network (FCPN), April Griffin, President
- * Florida Energy Teachers Network (FETN), Susan Van Buren
- * Florida Energy Workforce Consortium (FEWC), Kristie Kelley
- * Florida Medical Manufacturing Consortium (FMMC) Gary Havren
- * Florida Minerals and Chemistry Council
- * Florida Sterling, Dione Geiger, Executive Director
- * Gainesville Area Chamber of Commerce, Staci Bertrand, Director of Industry Development
- * Manufacturers Association of Central Florida, Sherry Reeves, Executive Director
- * Manufacturers Association of Central Florida, Amanda Markusky
- * Manufacturers Association of Central Florida, Kenneth Bush
- * Manufacturers Association of Central Florida, Dennis Solobesky
- * Manufacturers Assoc. of Florida, Amanda Bowen, Executive Director
- * Manufacturers Assoc. of Florida, Al Stimac, President
- * Manufacturers Association of Florida's Space Coast
- * Mid Florida Regional Mfg Assoc., Rob Adamiak, President
- * Manufacturing and Supply Chain Alliance of Mid Florida (MSCA) Tom Grothouse, Executive Director
- * NCATC, Craig McAtee, Executive Director
- * NAM Manufacturing Institute, Jennifer McNelly, President
- * NTMA, Northwestern PA Chapter NTMA, Tami Adams, Executive Director
- * National Career Pathways Network (NCPN), Debbie Mills, President
- * Northwest Florida Mfg. Assoc.
- * Northwest Florida Mfg. Council, Cindy Anderson, Executive Director
- * Sarasota Manatee Manufacturers Association (SAMA), Peter Straw, Executive Director
- * Sebring Airport Authority, Beverly Glarner, Administrative Executive
- * SME, Pam Hurt, Strategic Alliances; Workforce development Manager
- * SME, Don Patz, Chairman SME Chapter 159
- * South Florida Mfg. Assoc., June Wolfe, President
- * Southwest Regional Manufacturers Association, Marni Sawicki, Executive Director
- * South Florida Manufacturers Assoc. (SFMA), Kaitlin Centonze, Member Services Manager
- * Upper Tampa Bay Manufacturers Association, Jerry Custin
- * Volusia Manufacturers Association, Jayne Fifer, Director
- * Volusia Manufacturers Association, Wayne VanOrden, Member

Business & Industry: FLATE partners with industry for outreach and curriculum activities and projects.

- * .decimal
- * A&N, Suzanne Mills, Director of Human Resources
- * ABB Inc.
- * ABCO Transport, Liz Escalante
- * Accuform Signs
- * Adams Group, Jonathan Adams, Chief Operating Officers
- * Admiral Furniture, Judith Lowther
- * AeC Inc.
- * Agilent Technologies





- * Aladding Equipment Co.
- * AMATROL
- * American Elite Molding, Bj Mitchell
- * American Tool & Mold, Richard McConnaughy
- * Aponte Tool and Manufacturing
- * Aqua Cal
- * Arthur Machinery Inc., Robert Arthur
- * Arthur Machinery Inc., Nilsa Cruz
- * Ascend, Franklin Alexander
- * ASO LLC, Don Shoup
- * Avatar Packaging
- * Awareness Technology Inc.
- * Bae
- * Ball Corporation, Janna Walls
- * BASF Corp.
- * Bausch & Lomb Christina Mead
- * Bausch & Lomb, Corrine Pielli
- * Beckwith Electric, Kevin Gerrish
- * Belac Industries, Patti Holland
- * Bell South, Sheryl Awtonomow
- * Bioderm Inc.
- * Biomet 3i
- * Bionetics
- * Black Diamond Strings
- * CAE USA
- * Canyon Bay Boats
- * Cardiocommand, James Moore
- * Cardinal Glass, Michelle Areedando
- * Catrike, Paulo Camasmie
- * Cavaform, Sylvia Minshall
- * Cavanaugh Co., Jim Cavanaugh, President
- * Cellynne Corp., Jorge Alteri
- * Central Florida Box Inc.
- * Certified Manufacturing, Michelle Rasbeck
- * Chapman Tool & Mold Inc.
- * Chromalloy, Manny Viera, Director of Human Resources
- * Chromalloy, Angie Rogers
- * City of Ocala Utilities, Mike McCleary
- * Clark Western Building Systems
- * ClosetMaid, Jennifer Boring
- * Coastal Caisson
- * Coca-Cola, Connie Mortimer
- * Coca–Cola, Barbara Watson
- * Combs Welding Design Inc., Connie Combs
- * Composite Motors
- * Conimar Corporation





- * CONMED, Largo, FL, Mark Snyder, VP Manufacturing
- * CONMED Largo, FL, Andy Matyk
- * CONMED Largo, FL, Dean Rock
- * Constellation Technologies
- * Consultant Electrical Engineering, Ed Homan
- * Cost Cast Inc.
- * Cross Match Technologies Inc.
- * CTC Tampa Bay
- * Custom Manufacturing and Engineering
- * Datamax Inc.
- * Dean Foods
- * Dentsply-Raintree Essix, Quiana Hanley
- * Ditek
- * DMG–Mori, Joseph Dobeck
- * Draper Laboratories, John Burns
- * DRS Optronics, Scott Choquette
- * DRS Optronics, Anthony Hicks
- * DRS Optronics, Mike Kelly
- * DRS Optronics, Bill Perelin
- * DRS, Mary Nutial
- * Draper Laboratories
- * Eastman, Wayne Henson
- * Edibon
- * EEI Manufacturing Services
- * EMS-USA, Mark Kemper
- * E-One Inc., Jason Thorp
- * E-One, Deana Brown
- * Emery Thompson Machine & Supply
- * EMI Industries
- * Enviro Tec., William Erdmann, Manager Engineering and Electronics
- * Featherlite
- * Fisher Electric Technology
- * Florida Atlantic Marine
- * Florida's Natural
- * Fluid Routing Solutions
- * Ft. Walton Machining, Dee Setzer
- * G&T Conveyor Co.
- * GE, Richard Foster, Robust Design Leader
- * GE, Kelli Owens
- * Gelato, Dave Carr
- * Gerdau Ameristeel
- * Givaudan Flavors Corp., Christina Hojnaski
- * Golden Flake, Jomie Maynard
- * Goodheart-Wilcox Publisher
- * H&S Swanson's Tool Co, James Swanson
- * Hale, Jennifer Folsom





- * Harris Corp, Mike Ennis, Eastern FL. State College (EFSC)
- * Harris Corp., Michael Ennis
- * Harris Corp., Julia Markardt
- * Heat Pipe, Ken Jurgensmeyer, Engineer; Mercedes Ramirez; Technician engineer
- * Hi Tek Truss
- * Hoerbiger, Karen Elordi
- * Hoerbiger, David Gonzalez
- * Honeycomb Company of America
- * Honeywell, Steve Askew, Super Instrumentation Svcs
- * Honeywell, Mary Anne Letteri, Manager Quality
- * InDyne Inc., Jamie Swanson, Network Training Instructor
- * Innovation Express
- * Intersil
- * IT Technologies
- * ITW Professional, Dan Shupsky, Vice President of Operations
- * Iverson and Company
- * Jabil Circuit
- * Jaeger Corporation, Mark Gaudio, Regional Manager
- * Jaeger Corporation, Rod Jaeger, President
- * JC Machine Inc, Jay Creasy
- * JC Machine Inc, Marlene Howell
- * Kegel Inc., Anthony Crews, Operations Manager
- * Kelly Services, Christina Meade
- * KHS USA Inc., Tom Brooker
- * Kimball
- * Kmart Distributions, Troy Bowman
- * Knight Armaments
- * Krausz, Mary Pfeiffer
- * Lakeland Electric
- * Lear Corporation, Charles Dixon
- * LEDnovation, Israel Morejon, President
- * Leslie Controls
- * Lockheed Martin, Tom Falanga
- * Lockheed Martin (Pinellas Park), Beth Ferguson
- * Lockheed Martin (Oldsmar), Katrina Stein
- * Lockheed Martin, Brian O'Connor, Director -Missiles & Fire Control
- * Lockheed Martin, Maricka Rogers
- * Machining Solutions
- * Manitowoc Food Service, Pam Dore
- * MaxPak, Steve Wasko, General Manager
- * MC Assembly, Vincent Burns
- * MC Assembly, Ben Thomas
- * MC Assembly, Bob Tortolano
- * Measurement Supply, Chris Sudetic
- * Measurement Supply, Nicole Stepp
- * Media Tech Plus





- * Mercury Marrine
- * MERRICK, Joe Tannehill
- * Metal Essences
- * MetLife
- * MicroMo Electronics Inc.
- * Micron PharmaWorks, Tevor Charlton
- * Micron PharmaWorks, Peter Buczynsky
- * Micron PharmaWorks, Ruth Michael
- * MILEO & Assoc.
- * Mitek, Ken Jurgensmeyer
- * MITRE
- * Mitsubishi Power Systems
- * Monin, Mike Brewster
- * Mosaic Company
- * Mtron PTI
- * Museum of Science and Industry (MOSI)
- * Nature's Products
- * NDH Medical Inc.
- * Neilson media
- * Nestle Waters, Tina Flannery
- * Network Centric Systems Engineering, Steve Park, Director
- * New England Machinery
- * Nokia
- * Norris Precision Manufacturing, Joe Norris
- * Northrop Grumman, John Casko, Engineer, Program Manager, Director and Engineering VP
- * Octex, Dan Mallon, Chief Financial Officer
- * Oldcastle Coastal, Judy Paredes
- * Pall Aeropower
- * PCA-Packaging Corp. of America, Joe Pozek
- * PCA-Packaging Corp. of America, Lori Borgan
- * PCA-Packaging Corp. of America, Neil Turley
- * Pepperidge Farm, Erin LaManna
- * Pepperidge Farm, Francy Arbonies
- * PGT Industries, Julie Guinn
- * PGT Industries, Anie Broks
- * Pierce Manufacturing
- * Plastipak Packaging Inc.
- * Polypack Inc.
- * Port of Tampa
- * POS-IMPACT LLC, Phillip Centonze
- * PPi Technologies Global
- * Pratt & Whiteney Rocketdyne
- * Promedica Inc.
- * Publix, Mike Williams, General Plant Manager Deli Kitchen
- * Publix, Shannon Patten, Media and Community Relations



- * Quality Electronic Manufacturing
- * R. L. Schrieber Inc.
- * R.C. Stevens Inc.
- * Raytheon, Lisa Maciolek, Materials Supervisor
- * RF Micro Devices
- * Rockford-Ettco Procunier, Larry Bull, President
- * Rockford–Ettco Procunier, Marshall Hurley
- * Rockford-Ettco Procunier, Courtney Giles
- * Rockwell Automation
- * Rockwell Collins
- * Sarasota County Communications, AccessTV, Jack Hoza
- * Schneller Inc.
- * Seal Dynamics, Peter Cirak
- * Seaway Plastics, Paul Bernard
- * Senninger Irrigation
- * Sensor Systems/ Fisher Motors
- * Siemens Energy & Automation
- * Siemens Power Generation
- * Sign-age Rachel Suarez
- * Signature Brands
- * SMC Corporation of America
- * Smith and Nephew, Keith Matthews, Quality Assurance Manager
- * Smiths Industries
- * Solid Works Inc.
- * Somatron Kim Britt
- * Somec Inc.
- * Southern Educational Services, Fred Hampton, President
- * Southern Manufacturing Technologies, Inc., Roy Sweatman, President
- * Southern Manufacturing Technologies, Inc., Shannon Sweatman, HR Director
- * Southern Powder Coat
- * Southland Logistics and Services Inc.
- * SPX, Dean Harding, Project Manager
- * Strand Core, Al Brown
- * Suncoast Technical College, Ed Doherty, Head Machining Instructor
- * Sun Hydraulics Corporation, Charles Haynie, Manufacturing Engineer
- * Sun Hydraulics Corporation, Eric Hare, Manufacturing Engineer
- * Syngenta, Gary Carter, Manager
- * Sypris Electronics, Debra Delise, VP Engineering
- * Sypris Electronics, Robert Sanders, Group VP
- * Tampa Armature Works TAW, Dave Adams, Engineer
- * Tampa Port Authority
- * TAW, Ellen Donegan, Recruiting Supervisor
- * TAW Custom Equipment, Marshall Moore, General Manager
- * Teak Decking Systems, Mike Havey
- * Technical Training Aids
- * TECO







- * Teltronics Sarasota
- * Townley Manufacturing, Brock Marthaller
- * Tropicana Products Inc.
- * USA Scientific, Bob Declerk
- * VacTron Equipment, Tim Fischer
- * Valpak, Steve Murphy, Production Director
- * Ven-Tel Plastics, Ed Venner
- * Ven-Tel Plastics, Mike Curran
- * VLOC Incorporated
- * Vulcan Machine, Mick Augustin, Manufacturing Manager
- * WinDoor Incorporated
- * Winco, Tisha Webber

ATE Centers & Projects: FLATE partners with NSF ATE projects and centers for projects and activities that draw on other expertise or collaborate on joint projects.

- * 360 Degree Center; Jeremy Leffelman, Director and PI
- * AC2 Bio–Link; Linnea Fletcher-PI, Angela Wheeler
- * ACE; Philip Craiger-Director and PI, Emily Coppa
- * AMTEC; Craig Hopkins-Project Director, Danine Aldeerete-Tomlin-Director and PI
- * ATEEC; Linda Baxley-Director, Ellen Kabat Lensch-Executive Director
- * ATE Central; Rachael Bower-PI, Catherine Dixon
- * BEST; Peter Crabtree, PI
- * Bio-Link; Elaine Johnson-PI, Lisa Huffman
- * CA2VES; Anand Gramopadhye-PI, Rebecca Hartley-Director of Operations
- * CAAT; Joe Petrosky-PI, Sherri Doherty
- * CARCAM; 2017 Pathtech collaborator
- * CREATE; Kathy Alfano, Gabrielle Temple, Marsha Buterbaugh
- * CSEC; Sujeet Shenoi, PI
- * CSSIA; John Sands-Director and PI, Virginia Swyndroski
- * CTC; Ann Beheler, PI, Debbie Miller, Mark Desmpsey
- * CyberWatch; Corrinne Sande-PI, Fran Melvin, Davina Mentle
- * CWW; Corrinne Sande, PI
- * DeafTEC; Donna Lange, PI
- * EvaluATE; Lori Wingate, PI
- * GeoTech; Vincent Dinoto Jr., PI
- * LASERTEC; Chrys Panayiotou, PI
- * MATE; Deidre Sullivan-PI, Jill Zande-Co-PI, Erica Moulton
- * MatEdU; Mel Cossettee-PI, Tom Stoebe, Robin Ballard
- * MPEC; Greg Kepner, PI
- * NACK; Robert Ehrmann-Director, Sue Barger
- * NanoLink, Deb Newberry-PI, Billie Copley
- * NBC2; Margaret Bryans-PI, Linda Rehfuss-Co-PI, Matt Marshall
- * NEATEC; Abe Michelen-Director and PI, Kate Alcott-Associate Director
- * OP-TEC; Dan Hull, PI
- * PACE-ME; Dan Horine, PI and Director


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- * PathTech (USF); Will Tyson-PI, Ed Fletcher-Quantitative Researcher, Chrystal Smith-Project Manager
- * RCNET; Kevin Cooper, Director and PI
- * RCNGM; Karen Birch-Director and PI, Wendy Robicheau-Project Manager
- * SCA; Colleen Molko, Associate Director at Norco College; CTE Project Director
- * SCATE; Elaine Craft-Director and PI, Emery DeWitt-Project Manager, Rick Roberts-Assistant Director
- * SCME; Matthias Pleil, Director and PI
- * SCTE; Kevin Flemming, Director and PI
- * SHINE; Alissa Agnella, PI
- * Skilled Workers Get Jobs; Pam Silvers-PI, Jim Sullivan-Co-PI
- * SMART; Tom Stout-Director and PI, Sandra Weber-Asst. Director
- * SpaceTEC; Steve Kane-Director and PI, Carolyn Parise
- * VESTA; Michelle Norgren, PI
- * Weld-ED; Ramona Anand-Project Manager, Duncan Estep-Director, Monica Pfarr-PI

Post-Secondary Education: FLATE partners with schools and districts for outreach, recruitment, articulations and curriculum.

* Aparico-Levy Tech. School (SDHC), Ann Marie Courtney, Principal

- * Atlantic Technical College & Technical High School, Kevin Finan, PI
- * Broward College, Chungag Chungag
- * Broward College, George Ortega
- * Broward College, Mohammad Dabbas, Faculty
- * Broward College, Mildred Coyne, Executive Director of Career & Workforce Education and Econ: Development
- * Broward College, Myrline Sterling
- * Broward College, Norm Seavers
- * Broward College, Russell McCaffery
- * Chipola State College, Margie Lee
- * Chipola State College, Darwin Gilmore, Dean of Workforce & Economic Development,
- * College of Central Florida, Corrine Wiygul
- * College of Central Florida, Karen Tolsen
- * College of Central Florida, Margaret Lee
- * College of Central Florida, Michael Shuler
- * College of Central Florida, Rob Wolf
- * College of Central Florida, Sam Ajlani, Faculty
- * Daytona State College, Cheryl Miller
- * Daytona State College, Ron Eaglin, Assoc. VP for Technology Education
- * Daytona State College, (An)Anindya Paul, Faculty
- * Eastern Florida State College, Barbara Eyer
- * Eastern Florida State College, Bruce Hesher, Asst. Professor, Electronics
- * Eastern Florida State College, Dona Tice
- * Eastern Florida State College, Frank Margiotta
- * Eastern Florida State College, Grace Svitak
- * Eastern Florida State College, Meer Almeer, Faculty, Program Coordinator
- * Eastern Florida State College, Steven Taylor
- * Florida A&M University, Andrew Chin



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- * Florida A&M University, Ronald Lumpkin
- * Florida Gateway College, John Jewett
- * Florida Institute of Technology, Gaby Hawat

* Florida Keys Community College (Key West), Patrick Rice, Chief Science & Research Officer, Dean of

Business & Marine Science

- * Florida Keys Community College, Halle Cheeseman
- * Florida Polytechnic University, Ryan Integlia
- * Florida Polytechnic University, Morris Melissa
- * Florida Southwestern State College, Doug Goldman
- * Florida Southwestern State College, Vincent Butler
- * Florida State College at Jacksonville, Alan Zube
- * Florida State College at Jacksonville, Belinda Potts
- * Florida State College at Jacksonville, Deryl High
- * Florida State College at Jacksonville, Patrick Land
- * Florida State College at Jacksonville, Sarah Wilson
- * Gulf Coast State College, Alan Jeffries
- * Gulf Coast State College, Melanie Boyd, Dean
- * Hillsborough Community College, Dr. Alessandro Anzalone, Dean A.S. Programs Brandon Campus
- * Hillsborough Community College, Tracy Barnes, Program Manager Electronics Technology
- * Hillsborough Community College, Dr. Julie White, Dean of Student Services, Brandon Campus
- * Hillsborough Community College, Dr. Debarati Ghosh, (Interim) Dean of A.A. Programs, Brandon Campus
- * Hillsborough Community College, Dr. Ginger Clark, Director of Technical Education
- * Hillsborough Community College, Deshjuana Bagley, Technician
- * Hillsborough Community College, Elizabeth McCullough, Chemistry Professor
- * Hillsborough Community College, Dr. Nancee Sorenson, President, Brandon Campus
- * Hillsborough Community College, Ryan Buckthorpe, Director the Corporate Training Center
- * Hillsborough Community College, Dr. Jennifer China, Campus President, SouthShore Campus
- * Hillsborough Community College, Dr. Allen Witt, Campus President, Dale Mabry Campus
- * Hillsborough Community College, Elizabeth Johnson
- * Hillsborough Community College, Ronald Smith
- * Hillsborough Community College, Shirley Dobbins
- * Hofstra University, David Burghardt, Engineering Dept. Chair; Co-Director, Center for Technological Literacy
- * Indian River State College, Kevin Cooper, Special Projects
- * Indian River State College, Gary Koser, Faculty
- * Indian River State College, Chrys Panayiotou, Faculty
- * Indian River State College, Dean Zirwas
- * Indian River State College, Joe Gorham
- * Indian River State College, Natalia Chekov
- * Keiser University, Stephan Athan
- * Lake Sumter State College, Carol Henry
- * Lake Sumter State College, Luis Pizarro
- * Lake Sumter State College, Alberto Luma
- * Lake Sumter State College, (Bob)Robert Seigworth





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- * Lake Sumter State College, Stan Sidor
- * Miami Dade College, Jeff Miller, Faculty/Advisor
- * Miami Dade College, Anselm Knights
- * Miami Dade College, James Poe
- * Miami Dade College, Antonio Delgado
- * North Florida Community College, Bill Eustance, Faculty
- * North Florida Community College, David Dunkle, Associate Dean of Economic Development and
- **Technical Programs**
- * North Florida Community College, Jorge Monreal
- * North Florida Community College, Steve Turner
- * Northwest Florida State College, Ray Rickman, Faculty
- * Northwest Florida State College, Dennis Sherwood
- * Onandaga CC, Bruce Hamm, Assistant Director Business & Workforce Development
- * Onandaga CC, Joe Vargo, Executive Director
- * Palm Beach State College, Alex Gorgevska, Faculty
- * Palm Beach State College, Ana Stolz, Program Manager
- * Palm Beach State College, Andric Oleg
- * Palm Beach State College, Carrie Pasquale
- * Palm Beach State College, Murcia A. Jeanne
- * Palm Beach State College, Uzma Amiruddin
- * Pasco Hernando State College, Edwin Goolsby
- * Pasco Hernando State College, George Michael
- * Pasco Hernando State College, Margie Burnham, Assistant Dean, STEM & Academic Affairs
- * Pensacola State College, Dan Busse, Director CTE
- * Pensacola State College, Mike Cannon, Engineering Tech Department Contact and Teacher
- * Pinellas Technical College, Eric McClendon, Associate Director
- * Pinellas Technical College, Jake Prokov, Associate Director
- * Polk State College, Mori Toosi, ET Program Director
- * Polk State College, Christopher Schilling
- * Polk State College, Henry Cabra
- * Polk State College, Orathai Northern
- * Polk State College Corporate College, Howard Drake, Director
- * Santa Fe College, John McNeely
- * Santa Fe College, Justin MacDougall
- * Santa Fe College, Wendy Hofer
- * School District of Hillsborough County, Lauren Walden
- * Seminole State, Leon Portelli, Dean
- * Seminole State, Christy Graves
- * Seminole State, Cecilia Larson
- * Seminole State, Michael Staley
- * Seminole State, Kirk Sawyer
- * South Florida State College (Avon Park), Erik N. Christensen, Dean
- * South Florida State College, Kevin Brown
- * South Florida State College, Tom Bush
- * South Florida State College, John Byrd
- * South Florida State College, Mary Danao



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- * South Florida State College, Garrett Lee
- * South Florida State College, Mahmood Azhar
- * Southwest Florida State College, Brian Botts, Director, Collegiate H.S
- * State College of Florida-Manatee/Sarasota, Daisy Volvulich, Program Manager
- * State College of Florida, Judith Bodenweiser
- * State College of Florida, Abby Gage
- * State College of Florida, John Montoya
- * State College of Florida, Jane Pfeilsticker
- * State College of Florida, Patty Roy
- * State College of Florida, Lee Kotwicki
- * State College of Florida, Kristey Richardson
- * St. John River State College, John Eitenne, Director of Computer Education
- * St. John River State College. Melissa O'Connell
- * St. John River State College, Anna Lebesch
- * St. Petersburg College, Lara Sharp, Program Director
- * St. Petersburg College, Brian Bell
- * St. Petersburg College, Ellis Dawn
- * St. Petersburg College, Greg Lewis
- * St. Petersburg College, Laura Malave
- * St. Petersburg College, Karen Bogues
- * Tallahassee Community College, Rick Frazier, Director, Workforce
- * Tallahassee Community College, Gideon Nnaji, Faculty
- * Tallahassee Community College, Mark Dickman
- * Tallahassee Community College, Steve Dunnivant
- * Tallahassee Community College, Jessica Jones
- * University of Florida, Ammy Donolly, Brian Ball, BET Faculty, Tamara Mandel, CERHB

* University of Florida Innovation Station (Sarasota), Allen Carlson, Regional Director, EG-Industrial Programs

- * University of Central Florida, Ben Reid, External Communications Coordinator
- * University of South Florida, Andrew Hoff
- * University of South Florida, Edward Fletcher
- * University of South Florida, Richard Gilbert
- * University of South Florida, Dr. Don Haynie, Prof. Physics
- * University of South Florida, Dr. Andrew Hoff, Professor of Electrical Engineering

* University of South Florida, Dr. Jayaram Lakshmi, Dept. of Sociology, PathTech, Lead Qualitative Investigator

- * University of South Florida, Dr. Susana Lai-Yuen, Assistant Professor IMSE
- * University of South Florida, Dr. Wilfredo Moreno, Professor of Electrical Engineering
- * University of South Florida, Dr. Rafael Perez
- * University of South Florida, Dr. Sylvia Thomas, Associate Dean of Diversity, COE
- * University of South Florida, Dr. Will Tyson, Associate Professor, Dept. of Sociology, PathTech
- * University of South Florida NREC, Jay Bieber, Technician
- * University of South Florida, NREC, Rob Tufts, Center Director
- * University of South Florida, Patricia Anzalone, Faculty
- * University of South Florida, Bernard Batson, Director of Diversity and Outreach Program, COE





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- * Valencia College, Nasser Hedayat, Associate VP, Technology Programs
- * Valencia College, Eugene Jones
- * Valencia College, Lisa Macon
- * Valencia College, James McDonald
- * Valencia College, Andrew Ray

Secondary Education: FLATE partners with schools and districts for outreach, recruitment, articulations and curriculum.

- * Alachua County Public Schools, Tina Gennaro, AODT Director/Instructor
- * Aparicio-Levy Technical Center, Steve Briant, Assistant Pricipal
- * Aparicio-Levy Technical Center, AnnMarie Courtney, Site Administrator
- * Bay County Schools, Michael Heptinstall, Education & Workforce
- * Bayshore HS, Laura Roberts, Career and College Counselor
- * Braden River HS, Gil Burlew, Dept. Chair, ACT Programs
- * Brevard County Schools, Devona Avaampato, Resource Teacher-Industrial & Tech Education
- * Brevard County Schools, Janice Scholz, Director of Career and Technical Education
- * Brewster Tech, JoAnn Abarelli, Asst. Principal
- * Brewster Tech, Mark Smith, Industrial Maintenance Instructor
- * Broward County Schools, John Miracola, Director
- * Buchanan Middle School, Walter Watts, Teacher
- * Charlotte County Schools
- * Citrus County Schools,
- * DeSoto County Schools, Larry O'Donnell, Director
- * Dowdell Middle Magnet School, Allan Dyer, Science Teacher
- * Duval County Schools
- * Escambia County School District, Lesa Morgan, Director, Workforce Education
- * Fred D. Learey Technical Center, Susan Miller, Principal
- * Gadsden County Schools, Kimblin Nesmith, Faculty
- * Glades County Schools, Scott Bass, Director
- * Greco Middle Magnet School, Susan Cunningham, STEM Lead Instructor
- * Hardee County Schools, Mike Wilkinson, Director
- * Hendry County Schools, Gary Breakfield, Director Workforce Development and Adult Education
- * Hernando County Schools
- * Highlands County Schools
- * Hillsborough County Schools, Jazheel Lenegar, Supervisor
- * Jacksonville Children's Commission, Charles Rutledge, Youth Development Specialist
- * Jefferson County Schools
- * Labelle Middle School, Gary White, Principal
- * Lake County Schools, Kim Brown, CTE Program Specialist Career-Technical
- * Lake County Schools, Patti Pearson, Career Education Program Specialist
- * Lake Tech, Diane Culpepper, Director
- * Lakewood HS CAT Program, Rose Mack, Teacher/Leader
- * Lakewood Ranch HS Gil McGrew, Teacher/Leader
- * Lee County Schools, Chelsea Gamache







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- * Leon County Schools
- * Levy County Schools, Carol Jones, Coordinator
- * Lively Technical Center, Randy Free, Assistant Principal
- * Manatee County Schools, Doug Wagner, CTE Director
- * Manatee County Schools, Carol Lewis
- * Manatee Technical Institute, Terry Parrish, Administrative Office Specialist
- * Marion County Schools, Sara LeFils, Outreach Programs
- * Marshall Middle School, Penny Reeves, Teacher

* Miami–Dade County Schools, Ralph Bryan, Instructional Supervisor, Technology & Industrial Education

- * Miami-Dade County Schools, Greg Zawyer, Principal
- * Middleton H.S., Kathy Freriks, curriculum
- * Middleton H.S., Kim Moore, Principal Curriculum
- * Middleton High School, Scott Mead, Teacher
- * Mid-Florida Technical Inst., Joe McCoy, Director
- * Milwee Middle School, Carol Unterreiner, Teacher
- * Marion Technical Institute, John Conway, Vocational Administrator
- * Marion Technical Institute, Dale Toney Teacher
- * Northeast High School, Academy of Information Technology, Elizabeth Royak, Director
- * Okeechobeege County Schools
- * Orange Co. Public Schools, Sheryl Awtonomow, Coordinator
- * Orange Co. Public Schools, Chip Bashinski, CTE Director
- * Osceola County Schools, Tim Burdette, Program Specialist ROTC Coordinator
- * Osceola Co. Public Schools, Joe Luciano, Resource Specialist, STEM, Law, Public Safety
- * Palm Beach County Schools, Cynthia McMillan, Farmworker Coordinator
- * Pasco County Schools, Robert Agues, Director of Community, Career & Tech. Education
- * Peterson Academy, Russ Henderlite, APT Teacher
- * Pierce Middle School, Eric Fernandez, Teacher
- * Pinellas County Schools, Gregory Taylor, Teacher, Industrial, Technical, Agribusiness & Public Services Education
- * Pinellas County Schools, Bob Hawkins, Supervisor, Industrial, Technical, Agribusiness & Public Services Education
- * Pinellas County Schools, William Lawrence, Associate Superintendent, C & I
- * Pinellas Technical Education Center, Dennis Johnston, Industry Services Coordinator
- * Polk County Schools, Lisa Harden, Principle for Polk County Public School District
- * Polk School District, Brian Grip, Teacher Resource Specialist
- * Rock Lake Middle School, Mia Conlon, Science Teacher
- * Santa Rosa County Schools
- * Safety Harbor Elementary, Robin Little, Engineering Coach
- * Sarasota County Schools & Career and Technical Education, Kyle Holbrook
- * School District of Hillsborough County, Dan McFarland, Secondary Science Supervisor
- * School District of Hillsborough County, Larry Plank, STEM Director
- * School District of Hillsborough County, Lauren Walden, CTE Supervisor
- * School District of Hillsborough County, Angel Danger, STEM/Science Coordinator
- * Seminole County Schools, Carol Gamble, Facilitator
- * St. Lucie County Schools



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- * Tampa Bay Technical High School, Robert Ivey, Welding Instructor
- * Volusia County Schools, Daniel Cox, Curriculum Specialist, Career & technical Education
- * Wakulla County Schools
- * Withlacoochee Tech, Debra Stanley, Assistant Director
- * Woodlawn Middle School, Kristina Beecher, Technology Education Teacher
- * Young Magnet M.S., Bill Gantner, PLTW Master Teacher

State Agencies, Economic & Workforce Development: Formal and informal partnerships many state, regional organizations for outreach, dissemination, and subject matter expertise.

- * AMSkills, Tom Mudano
- * AMSkills, Jady Vargas
- * AFFOA, Noah Droi, Workforce & Education Director
- * Bridg, Gloria Wiens, Tech Innovations
- * Career Source Florida, Andra Cornelius, Senior VP of Policy & Programs
- * Career Source Tampa Bay, Jody Toner, Program Director
- * CEWD, Center for Energy Workforce development, Ann Randazo, President
- * Citrus Levey Marion Workforce Board, Rusty Skinner
- * eFlorida, Michael Schiffhaur, International Commerce
- * FETN, Susan VanBuren
- * FEWC, Kristie Kelley, Chairperson
- * FEWC, Carol Higley, Chairperson
- * FLDOE, Mark Baird
- * FLDOE, Kathryn Frederick, Supervisor, Energy
- * FLDOE, Richard (Ted) Norman, Supervisor, Manufacturing
- * FLDOE, Eric Ownes, Senior Director CTE
- * FLDOE, Joan Roddenberry
- * Hillsborough County Economic development, Bruce Register, Director
- * NC State University
- * Nextflex, Brynt Parmeter, Director of Workforce Development
- * NIST/MEP, Mary Ann Pacelli, Manager of Workforce Development
- * Pinellas County Economic development, Laura Berkowitz
- * Power America, Nick Justice, Director
- * Power America, Pam Carpenter, Director of Education & Workforce Development
- * Tallahassee Economic development, Beth Kirkland
- * Tampa-Hillsborough County EDC, Ken Jones

Other Educational Collaborators and Projects: Formal and informal partnerships for outreach, dissemination, and subject matter expertise.

- * Champion Now, Terry Iverson, Founder
- * College Reach Out Program (CROP), Brian Rodriguez, HCC Project Manager
- * FACTE (Florida Association of Career and Technical Education), Marsan Carr
- * Georgia Quick Start, Bruce Batton, Director of Northern Project Operations
- * Goodwill Industries, Dale Person, Manager
- * Good Will Industries, Tim Goodman, HSHT Program Manager



Florida Advanced Technological Education Center of Excellence





- * Hillsborough Community College Engineering Club, Dr. A. Ambrioso, Faculty Advisor
- * Hillsborough Education Foundation, Rebecca Davis
- * Junior Achievement, Carol Williams, Program Director
- * Middleton HS FRC Minotaur Robotics Team, Rich Berglund
- * MSSC, Leo Reddy, CEO
- * MSSC, Catherine Feeney, Outreach Manager
- * PACE, Christie Haley Activities Director Manatee County
- * PathTech LIFE, University of South Florida, Dr. Will Tyson
- * Pinellas Education Foundation, Susan Hancock
- * Scientific League, Audrey Buttice and Samuel DuPont, Founders
- * Trinity Homeschool Academy, Tonya Walters

Outside the United States or with an international organization

* DuocUC, Professional institute and technical training center. Patricia Velasco, Deputy Director of Articulation

* ISTEC, Ibero-American Science & Technology Education Consortium, Pr. Willy Moreno

* Universidad Santo Tomas, Colombia. Electronics Engineering Department, Pr. Javier Enrique Gonzalez Barajas

- * IKASLAN Mobility, Spain, Sergio Fidalgo, International project coordinator
- * Politeknika Txorierri, HETEL, Spain, Anabel Menika, Head of Internationalization
- * TKNIKA, Spain, Basque Department of Education, Vocational Training & Lifelong Learning Jose Fernandez, International manager

* Slovenia Ministry of Education, Slovenia

OUTREACH				
PROGRAM	Partner(s)	Partner Role	Progress	Post-Its
FLATE Awards	FACTE ¹ / FAITE ² / Award sponsors/FloridaMakes	FAITE, a division of FACTE, will take over and "host" the FLATE awards – keeping the FLATE name and FLATE with FloridaMakes will continue to support.	The first FLATE awards at FACTE occurred at the 2016 FACTE annual conference. FLATE will now start to transition the sponsors to FAITE for the 2018 Awards.	FLATE is working closely with FACTE/FAITE to fully transition the FLATE awards. FLATE recruited sponsors; FACTE has added FLATE to its awards pack; both will recruit nominees and judge. The transition should be done by the 2018 Awards.
"Made in Florida" website	The website is transitioning to FloridaMakes ³ . Important documents and products are archived on ATE Central.	Host and maintain all/some of the videos and resources online. Limited conversations about some content being maintained by FAITE/FACTE and FloridaMakes have been initiated.		Much to do to transition this to FloridaMakes. Requires resources to support postings, future revisions, etc.
"Made in Florida" and "Women in Manufacturing" DVDs/Videos	Transitioning to FloridaMakes	Maintaining current posting of 2015 Video on YouTube, and a Florida website as well as maintain master video.		Plans include distribution of the MIF/ WIM DVD copies until current stock is gone. Video will be archived on ATE Central & Youtube accessible through fl-ate.org & madeinflorida.org
FLATE Summer Robotics Camps @ HCC	HCC Brandon AS ET Degree program for camps 2018 and onward.	Host camps and take over the ownership and maintenance of the robot hardware. Take over organizing and running the summer camp programs.	The 2016 published FLATE camp curriculum will help sustain the quality of the camp locally and across the state. The curriculum and Camp survival guide are free and available resources.	FLATE Robotics camps at HCC have been very successful and popular. Transition has some issues but since we work closely with the ET degree team, we anticipate it will be smooth with much mentoring). Cost might go up, and integrity down as well as fewer camp sessions offered.
FLATE Summer Robotics Camps @ other locations	Many colleges/ schools/ community organizations.	Host and run camps using FLATE curriculum and its surveying tools, and data aggregation and continuous improvement.	Published standard camp curriculum for intro and intermediate levels. Update Camp Guide in 2016 and archived the revisions.	Continue to support existing camps with curriculum, processes, student and parent surveys. Camps should continue locally un-interrupted. May lose statewide impact/comparisons.

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OUTREACH [Continued]							
PROGRAM	Partner/s	Partner Role	Progress	Post-Its			
Industry Tours (individual tours of schools to manufacturers)	Manufacturers/schools/ RMAs ⁴ / Colleges/ other community organizations.	Facilitate local connections for schools-companies and support tour logistics.	Transferred most of the transportation cost to the school districts/schools and connected schools to companies. A lot of capacity has been built with RMAs.	These connections will hopefully continue as teachers make time, the partners stay connected, and school districts/others (or grants) support transportation. We've established defined impact.			
Manufacturing Day Coordination	Manufacturers/schools/ colleges/RMAs/ FloridaMakes.	Regional and statewide coordination efforts for max impact. Local partners are working well now in most counties. Partner needed to connect regions for defining state impact.	Statewide coordination will transition to FloridaMakes and the RMAs ⁴ . Will continue to coordinate student survey data under FloridaMakes.	Local/regional coordination continues to improve and expand.			
Student/Teacher Outreach (Robotics)	School districts/ college partners/ industry partners	Logistics, costs, data collection (surveys/photos), dissemination.	Related to robotics camps equipment. Not clear where these will transition.	This is a one-to-one activity so it depends on individual relationships/ partnerships.			
K12 curriculum/lesson plans/Best Practice Guides	ATE Central (NSF ATE document/resource repository)/FloridaMakes	Central (NSF ATE iment/resource isitory)/FloridaMakes Archive documents in online database and resource portal. FLATE wiki will transition to FloridaMakes. All current middle schools, high schools, colleges, and community resources on the wiki are now archived on ATE Central.		Survey data, consistency, some PD teacher training resources may end. Updates to archived materials will not be made, and nothing new will be added.			
Public relations for manufacturing (school/community presentations/ replies to national requests for FLATE expertise	Professional organizations/ college technical programs/ local/RMAs/ FloridaMakes/ other organizations.	Connect manufacturers with students and educators to secure partnerships.	Continuously transitioning knowledge, content, contacts, and building capacity and continuing under FloridaMakes to some extent.	This will transition to FloridaMakes. We hope we have built some capacity in our partners and colleges to continue the work they are now doing somewhat on their own.			
FLATE Focus newsletter/social media/dissemination	FloridaMakes, RMAs	Publish blog articles of interest to our stakeholders.	Continuing efforts until FLATE funding expires.	This activity will continue under FloridaMakes.			

PROFESSIONAL DEVELOPME	PROFESSIONAL DEVELOPMENT [PD]						
PROGRAM	Partner/s	Partner Role	Progress	Post-its			
Engineering Technology Forum	Colleges/ vendors/ FLDOE permanent chair/FloridaMakes	Meetings are self-funded. Meals are provided by vendors, forum chair and host provide logistics; and colleges support travel. FLATE supplies PD, impact data, organization and funds for some colleges to attend.	The ET Forum will transition to FloridaMakes oversight. It is secure in most areas but extra funding from FLATE for some colleges, focused PD sessions, some organization/logistics, and website/social media.	The ET Forum will go on and hopefully not lose its tight connection between industry and local colleges, while continuing to maintain partnership with FLDOE, and continue to provide robust networking and strong community among colleges. Hope to increase industry connections through FloridaMakes.			
Florida/ national A.S. Program mentoring	None			This activity may be transitioned to fee-based private consulting.			
Other Educator Professional Development Workshops	Current partners include: SkillsUSA/ FACTE/ High School-High Tech program of the Able Trust/ FAITE/ professional societies/ equipment vendors/FloridaMakes.	Various partners host some events, provide travel, and sustenance support for educators and sometimes need volunteer partners for logistics. FloridaMakes will provide some support for college level workshops.	Continuing efforts to transition more ownership of workshops totally to other organizations. Do not yet have any confirmed commitments.	Most K12 FLATE PD events will probably stop. They require personnel time to organize, disseminate and produce. No organization has been identified to take on these activities; however, we are working to transition some events. FloridaMakes will support college level workshops.			
Conference attendance support	State Colleges/ school districts/ local education foundations.	College and high school faculty will rely on other sources/partners (colleges, school districts, or other grants.)	Continuing efforts until FLATE NSF funding expires.	FLATE supported faculty conference attendance every year by request and with good rationale. This will terminate.			

CURRICULUM					
PROGRAMS	Partner Role	Partner Role	Progress	Post-its	
Secondary/post-secondary curriculum frameworks reviews and alignments.	FLDOE⁵ Florida College System/FloridaMakes	Ja College daMakes FLDOE will maintain its tri- annual review cycle for frameworks to keep them industry relevant. Colleges will have to coordinate the reviews by Engineering Technology's discipline areas.		FLATE's coordinating role will continue under FloridaMakes.	
Engineering Technology enrollment /completion/ graduate reporting (secondary/ postsecondary)	FLDOE/ possibly Daytona State College/FloridaMakes	All data available from FLDOE, but not in the currently aggregated report FLATE has developed for the programs that support FL manufacturing.	This activity and data collection will transition to FloridaMakes.	Most recent reports will be archived (some on ATE Central) at end of the NSF grant.	
Credential alignment to Florida manufacturing programs	None	No partner with required expertise has been identified.	Continuing efforts until FLATE's NSF funds end. Unclear about transitioning to FloridaMakes	Its unclear if this will transition to FloridaMakes and continue. Alignments will become outdated but archived on ATE Central. This could be a revenue source.	
International Student/ Educator Exchange	Educational /government partners in other countries and US/ college nternational programs.		Researching funding opportunities domestically and overseas.	Ongoing activity could transition to the private partners for overall coordination and implementation if funding is identified and secured.	
Mentoring/support of new Engineering Tech programs	Engineering Technology Forum Community/FloridaMakes	Voluntary mentoring of new and transitioning manufacturing related programs.	This will transition to FloridaMakes with help from ET faculty. Capacity is building in the Engineering Technology Forum Community to continue.	This activity is very important for development and growth of ET /manufacturing programs. It could provide small consulting revenues for FloridaMakes.	

¹ FACTE: Florida Association for Career and Technical Education

² FAITE: Florida Association for Industrial and Technical Educators

³ FloridaMakes: Florida (MEP) - Technology's Manufacturing Extension Partnership

⁴ RMAs: Regional Manufacturers Associations

⁵ FLDOE: Florida Department of Education



Understanding pathways in advanced technologies.

FINDINGS REPORT 2017



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PROJECT OVERVIEW

- National Science Foundation (NSF) funded Advanced Technological Education (ATE) Targeted Research in Technician Education
- Partnership between University of South Florida, Florida Advanced Technological Education Center (FLATE) at Hillsborough Community College and national ATE Center Partners
- National survey of community college students in advanced technology fields in collaboration with a national network of colleges.
- PathTech LIFE seeks to understand how learning, interests, family, and employment (LIFE) experiences
 of two-year college students impact their decisions to enroll, return for further coursework, and/or
 pursue a certificate or degree.

BACKGROUND – PathTech Tampa Bay

- Successful Academic and Employment Pathways in Advanced Technologies (NSF #1104214)
- \$1.2 million over 4 years (2011-2015)
- Examination of educational and employment pathways through interviews and observation in local high schools, community colleges, and industry



TIMELINE

September 2015 – January 2016	Drafted initial survey
February – April 2016	Received input from panel of experts made up of two people from each ATE Center using Delphi technique (three iterative rounds)
April 2016	Completed survey revisions Completed IRB modification
April – May 2016	Distributed Wave 1 pilot survey to students at six colleges (97 respondents)
June – August 2016	Analyzed data Revised survey based on findings
September 2016	Conducted one-on-one interviews with four students while taking survey
October 2016	Completed survey revisions Completed IRB modification
November – December 2016	Distributed Wave 2 pilot survey to students at 18 colleges (147 respondents)
January – March 2017	Shortened survey from 25 to 15 minutes Revised distribution plan to include direct communication with colleges Completed IRB modification
April 2017	Distributed Wave 1 national survey to students at 26 colleges (534 respondents)
May – August 2017	Analyze Wave 1 national data, prepare reports, publications and presentations
September 2017 – August 2018	Distribute Wave 2 (Fall 2017) and Wave 3 (Spring 2018, tentative) national surveys Conduct ongoing analyses, prepare reports, publications, and presentations



SURVEY TOPICS

- Academic Background
- College Experiences
- Employment Background
- Employment Status
- Motivation for Enrollment
- Program Evaluation
- Academic Goals
- Career Goals
- Demographics

RECRUITING

- Recruited colleges through ATE Centers
- Offered colleges \$250 + findings report for their college if they delivered a 70% response rate
- All student respondents received \$25
- Survey took 15 minutes



SURVEY INFORMATION

SURVEY LOGISTICS

Opened: April 3, 2017

Closed: May 2, 2017

Send to: 26 Colleges

Total Respondents: 528 students

SAMPLE SIZE

387 students14 colleges

Total survey responses included 528 students at 26 institutions. The <u>representative sample</u> of 387 is based on students colleges that had a <u>response rate of 50% or higher</u>.

PROGRAM SELECTION

Programs who participated as identified by students*:





ENERGY AND

ENVIRONMENTAL TECHNOLOGY (28%)



ADVANCED MANUFACTURING (14%)



MICRO AND NANO TECHNOLOGY (2%)



NONE OF THE ABOVE (13%)

*Students selected all that apply therefore percentages add up to more than 100%



DEMOGRAPHICS

THE MAJORITY OF THE 387 RESPONDENTS WERE BETWEEN THE AGES OF 18-30.



84% OF THE 385 RESPONDENTS WERE MALE.



243 (63%) OF THE 387 RESPONDENTS INDICATED THAT THEY WERE WHITE.*



*Students selected all that apply therefore percentages add up to more than 100%



ENROLLMENT/EMPLOYMENT/JOB STATUS

More full-time students are employed part-time, and more part-time students are employed full-time. Only **34% of full-time students** have jobs related to their field, compared to **48% of part-time students**.

		Full-Time Student	Part-Time Student	
	Full-Time Employed 23% (>35 hr.)		28%	
Employment Status	Part-Time Employed (<35 hr.)		36%	
	Not Employed	34%	30%	
Job related	Yes	34%	48%	
to program	No	66%	52%	

*Table does not include seasonal workers, or military.

n=387



Q: WHICH FACTOR WOULD YOU SAY IS THE MOST IMPORTANT REASON WHY YOU CHOSE TO ENROLL THIS SEMESTER?

PRiSM Decision Model for Adult Enrollment (Stein & Wanstreet, 2006):

Pathway to a Better Life adults' assessments of the extent to which their own cognitive and economic conditions might be enhanced as a result of participation in a higher education program.

Reflective Learner - how students attempt to evaluate their own academic abilities and academic readiness to pursue a degree.

Synchronizing Learning, Earning, and Living - emphasis on their particular life stage as well as their abilities to balance learning, earning, and living as critical determinants in their decisions to pursue enrollment in higher education.

Match with an Academic Life importance of adults seeking a fit with the academic program's curriculum, policies, requirements, support, and accommodation with adult learners.





EMPLOYMENT STATUS AND GPA

Among students with a job related to their field, a higher percentage of students with **part-time jobs** (68%) have GPAs 3.5 and above compared to those students who have **full-time jobs** (59%) related to their field.



Part-time Job



Highlighted includes students with GPAs 3.5 and above.

EDUCATIONAL BACKGROUND

Prior to beginning the program, 51% of students had not enrolled in a 2-year or 4-year institution. More students had previously enrolled at a 2-year college (34%) compared to those who enrolled in at a 4-year college (19%). Five percent of students had enrolled in both. Among the 113 students who had enrolled in a 2-year college, 39% had earned an associate degree. Among the 73 students who had enrolled in a 4-year university, half earned a bachelors degree. Six students had earned an associate's and bachelors.





LIFE CHANGES

The majority of students experienced a **positive change** on **employment** and **other major life events** in the 12 months before enrolling in the program. Fewer than 25% of students experienced a negative change in **employment**, **family**, and **other major life events**. Though, **44% of students** reported experiencing a **negative change** in their **financial situation** before enrolling.



SATISFACTION & PROGRAM ACCOMODATIONS

Students were very satisfied with their programs. Overall the average for all categories was 3.84 out of 5. Advising was scored the lowest at 3.6 and general received the highest satisfaction at 4.0 out of 5.

General			4.0	
Courses			3.9	
Instruction			3.9	
Advising			3.6	
Interaction			3.8	
1.0	2.0	3.0	4.0	5.0

Over half of the students reported that the program accommodated their work schedule and lifestyle choices very or extremely well. Only 3% indicated that the program was not accommodating in these areas.

3%	8%	32%	40%	17%
SI	ightly we	II Moderately we	l Very wel	I Extremely well



Not well

HOW STUDENTS PAY FOR COLLEGE

	Scholarships/Financial Aid from College (27%)	Personal Savings (27%)	Student (165	Student Loan (16%)	
Financial Aid from Government (40%)		Military (9%)	Employer Assistance (8%)	Second Job (5%)	
Income from Primary Job (29%)	Family Contribution (27%)	Other (9%)	Overtime or increased hour (4%)	Perso nal Loans (2%)	

Percentages represent average response, not total count.

TARGET CREDENTIALS

Most students were planning to obtain a **associate's degree**. Only 12% were aiming to get **continuing credit** or **other** credentials.





PathTech LIFE Findings Report 2017

LONG-TERM GOALS

55% of students reported that their goal was to obtain a bachelor's degree. 48% planned to earn an associate's degree. Nine percent of students indicated their goal was to get a doctoral degree.



CAREER COMMITMENT AND CONTRIBUTION TO FUTURE

Most students are very committed to pursing a career related to what they are studying in their ATE program.

1	5
4.	3

On a scale of 1-5, 1 being the least committed and 5 being the most.

74% of students indicated that gaining knowledge in their field was the biggest contribution the program could have on their career.



Students ranked their top five selections, the five items above were the top ranking among students. "Gain respect from my colleagues" and "Some other way" were the lowest ranked and are not represented above.



FIVE REASONS STUDENTS ENROLLED

Factor analyses identified five sets of reasons students enrolled scaled from 1-10:



1 PERSONAL WELL-BEING

4.7 out of 10 (mean score)

- No demographic differences
- Less important for part-time workers compared to full-time workers



"I want to improve my personal growth"



5.6 out of 10 (mean score)

- More important for younger students
- Less important for Black students
- Less important for married students than single students
- Less important for students with Bachelor's degrees compared to students with no twoyear or four-year college enrollments

"I can overcome academic challenges"

"I am willing to make the effort to complete the program"

3 SKILL BUILDING

6.9 out of 10 (mean score)

- Less important for women than men
- Less important for Black students compared to White students
- Less important for married students than single students
- Less important for seasonal workers than full-time workers

"I have always liked to build and fix things with my hands"

"I want to build my technology skills"

PathTech



JOB AND FINANCIAL CONCERNS

4.9 out of 10 (mean score)

- Less important for women than men
- Less important for Black students compared to White students
- More important for students in relationships (married, separated, or cohabitating) than single and divorced students
- More important for part-time workers overall, but less important for part-time and fulltime workers in jobs not related to their major field
- More important for students with a bachelor's degree

"A change in employment or job responsibilities"

"A change in finances or financial concerns"



FAMILY AND OTHER CONCERNS

3.3 out of 10 (mean score)

- More important for older students
- More important for men
- More important for Black and Asian students
- Less important for Other race students
- Less important for students who are unemployed but not looking compared to full-time students

"A change in family commitments"

"Some other major life change (aside from employment, finances, or family)"



PathTech LIFE Findings Report 2017

AGE AND FAMILY

- Older students are more motivated by family changes and less motivated by the desire to face academic challenges.
- Married students are less likely to report enrolling to face academic challenges and to build technical skills, but more likely to enroll due to job and financial changes or family changes. In addition, cohabitating and separated students rate job and finances as reasons to enroll higher than single students. We find no effects due to having children or number of children or household income.

GENDER AND RACE

- Men are more motivated by skill building, job and financial changes, and family changes than women.
- Black students are less likely to report enrolling to face academic challenges and to build technical skills. Black and Asian student are more likely to enroll due to job and financial changes.

EDUCATION AND EMPLOYMENT

- There were no differences in motivation based on enrollment.
- Students with bachelor's degrees (9%) were less likely to list willingness to overcome academic challenges as a reason to enroll compared to students with no enrollment (46%). They were far more likely to list financial concerns as a reason.
- Part-time workers are less likely to express personal growth as a reason for enrolling compared to full-time workers. Part-time workers are more likely to be motivated by financial concerns; however, this effect is countered by a negative association for those in a job not related to their major field.
 - This indicates that part-time workers in a related job were more likely to be motivated by financial concerns and full-time workers in an unrelated job were less likely.



NEXT STEPS

FALL 2017

- Webinar | August 30, 2017
 - Programs interested in participating in PathTech LIFE Fall 2017 Survey
- Fall 2017 Survey
 - Available in mid-to-late September
- Updated 2017 Findings Reports
 - Distributed in January 2018

SPRING 2018

• Publications will continue through Summer 2018



Will Tyson

Principal Investigator Associate Professor Department of Sociology University of South Florida



20 Florida Manufacturing

Obtaining feedback from industries is vital to reviewing curriculum content of schools preparing a competent workforce to meet industries' needs. The survey was developed by FloridaMakes in partnership with Polk State College (PSC), the Florida Forum for Engineering Technology (ET Forum) and FLATE (Florida Advanced Technological Education Center of Excellence). It was designed to define curriculum content of schools preparing competent workforce to meet manufacturers technician workforce needs.

The 15 minute survey was distribute to manufacturers in Florida via (a) FloridaMakes; (b) Florida Regional Manufactures Associations (RMA's); and (3) State and Community college offering A.S. ET Degrees. The survey was open for 2 weeks in November 2017. Eighty-eight respondents from across Florida completed the survey during that time period.

Section 1 of the survey focused on Technical Skills and requested two responses for each item: one for the importance of the item and the second for the frequency performed. For each importance item, respondents were asked to rank the importance responses using a scale from 1 to 5, with 5 being "Most Valuable" and 1 being "Least Important." Respondents could also select "N/A" (Not Applicable) as an option if appropriate. For frequency performed, respondents were asked to select one of three choices: "Never", "Sometimes" or "Always". If N/A was selected for the importance response, respondents were asked to select "Never" for the frequency response.

Section 2 was for personal and teamwork skills. Section 2 requested responses for only the level of importance and used the same 1-5 scale as that used for the technical skills in section 1.



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Competencies/Learning Objectives Descriptions	Freq	Frequency of Use		Knowledge	Specialized
Competency Descriptions (1-20)				Levels	Skills Levels
Technical Skills: A highly skilled employee at this plant is expected to have in-				1-8 Level of	1-8 Level of
depth technical knowledge, critical thinking and judgement abilities, and systems				credentials	credentials
thinking abilities in order to:				Ranked highest at	Ranked highest at
	Never	Sometime	s Always	1-5 of importance	1-5 of importance
1. Implement all related safety codes and regulations in industrial working			· · ·		
environments	2%	24%	74%	L 3 Rank 5 @ 70%	L3
2. Perform tasks in a specialized technical area.	1%	41%	58%	L 4 Rank 5 @ 46%	L 3
3. Work with computer aided drafting and create geometric part files.	21%	52%	27%	L 3 Rank 3 @ 25%	L 3
4. Work at the entry level with traditional materials removal machines (milling,					
lathe, drill press, cut-off-saws).	22%	55%	24%	L 1 Rank 4 @ 26%	L1
5. Understand mechanical and process characteristics of common materials.	6%	58%	37%	L 4 Rank 4 @ 58%	L 2
6. Operate materials testing tools and equipment.	8%	67%	25%	L 4	L 5 Rank 4 @ 31%
7. Operate, maintain, and repair mechanical, hydraulic and pneumatic systems.	18%	58%	24%	L 3	L 3 Rank 4 @ 27%
8. Operate AC electric-powered tools, and equipment	8%	47%	45%	L 2	L 2 Rank 5 @ 31%
9. Operate DC electric-powered tools and equipment.	18%	52%	30%	L 2	L 2 Rank 3 @ 30%
10. Operate electronic sensors, switches, and controls.	9%	50%	41%	L 2	L 2 Rank 4 @ 29%
11. Operate programmable logic controllers and use systems schematics.	14%	59%	27%	L 3	L 3 Rank 4 @ 33%
12. Diagnose causes and troubleshoot systems operations, using schematics and					
ladder logic diagrams.	17%	61%	21%	L7	L 5 Rank 3 @ 25%
13. Report total quality improvements of a unit and the entire systems operation.	19%	63%	18%	L 8	L 7 Rank 3 @ 34%
14. Evaluate the results of tasks performed in accordance with standard operating					
procedures (SOPs).	8%	43%	49%	L 4	L 3 Rank 4 @ 34%
15. Perform root cause analysis and recommend corrective actions.	7%	58%	35%	L 7	L 7 Rank 4 @ 35%
16. Participate in planning and evaluating processes.	5%	70%	25%	L 7	L 7 Rank 3 @ 37%
17. Compare and contrast process alternatives.	14%	66%	20%	L 7	L 7 Rank 3 @ 34%
18. Recommend new solutions and consider effects on various processes even in					
circumstances where requirements are subject to frequent changes.	7%	62%	31%	L 8	L 8 Rank 5 @ 31%
19. Demonstrate a high level of independent judgment in a range of technical					
functions and articulate significant challenges involved.	3%	43%	54%	L 7	L 7 Rank 5 @ 42%
20. Participate in the development of an existing and/or new product and/or					
operation.	11%	56%	33%	L 8	L 8 Rank 5 @ 34%

Competencies/Learning Objectives Descriptions	Frequency of		Personal	Social	
Competency Descriptions (1-20)	Use		Skills Level	Skills	
Personal & Team Skills: Index factors for personal and team skills are based on self-sufficiency, responsibility, and self-awareness, and reflectiveness. In addition team skills are measured based on communication, involvement, work ethic, character, adaptability, problem solving, critical observation, teamwork, and leadership. Employees should be able to demonstrate the ability to:	% Ranko importa AVEF	ed @ the ant. WEI RAGE xx,	e most GHTED /5.0	1-8 Level of credentials Ranked highest at 1-5 of importance	1-8 Level of credentials Ranked highest at 1-5 of importance
1. Use required learning guides and request learning guidance when needed.	53.4%	WA	4.4	L 2	
2. Use initiative to set their own enhanced learning objectives related to daily tasks and performance.	38.7%	WA	4.1	L 3	
3. Evaluate personal strengths and weaknesses of knowledge and performance related activities.	27.3%	WA	3.9	L 4	
4. Define objectives for new simple applications and establish tasks to accomplish the objectives.	25.0%	WA	3.8	L 4	
5. Share with team members alternative ideas and strategies to define the objectives of complex					
applications.	46.6%	WA	4.2		L 3
6. Express the mission, goals, and objectives of the workplace.	39.8%	WA	4.1	L3	
7. Take responsibility for work environment.	81.8%	WA	4.8	L 5	
8. Demonstrate interpersonal communication.	60.2%	WA	4.5		L1
9. Follow rules and regulations in the workplace.	87.5%	WA	4.8	L 2	
10. Execute team assignments competently.	70.5%	WA	4.6		L 3
11. Listen effectively.	80.7%	WA	4.7		L 2
12. Effectively participate in a diverse work environment	63.6%	WA	4.5		L 3
13. Communicate clearly, timely, and relevant information on processes and results at all levels.	62.5%	WA	4.5		L 4
14. Conduct, analyze, interpret, and present complex facts and provide solutions.	27.3%	WA	3.9	L8	L 6
15. Take appropriate corrective actions based upon provided feedback.	59.1%	WA	4.5	L 5	
16. Build consensus from group discussions.	27.3%	WA	3.9		L3
17. Demonstrate the ability to transfer information and specialized skills to others.	36.4%	WA	4.1		L6
18. Set short-term and long-term goals.	33.0%	WA	4.0	L 4	
19. Represent the organization in a professional manner.	71.6%	WA	4.6		L8
20. Demonstrate appropriate social skills.	59.1%	WA	4.5		L6

Rank 3 Rank 4 Rank 5

Knowledge Levels

- 1. Demonstrates General Knowledge.
- 2. Demonstrates and uses basic knowledge.
- 3. Demonstrates and applies extended knowledge for predictable problems.
- 4. Demonstrates comprehensive theoretical & technical knowledge.
- 5. Demonstrates integrated & special professional knowledge.
- 6. Demonstrates broad integrated knowledge regarding scientific principles & practical application of scientific subject.
- 7. Demonstrates specialized knowledge in subject, & can involve in professional activities.
- 8. Demonstrates specialized knowledge in adjoining disciplines including knowledge in a new discipline or profession.

Specialized Skills Levels

- 1. Demonstrates basic cognitive & practical skills to perform tasks within stipulated rules.
- 2. Demonstrates skills needed to establish correlations among functions and tasks.
- 3. Demonstrates cognitive & practical skills for perform tasks & problem solve.
- 4. Demonstrates ability to select alternative actions based on reciprocal effects on other functional areas.
- 5. Plans and evaluates processes while considering alternatives and impacts.
- 6. Develops & evaluates new solutions & considers effect on various criteria.
- 7. Demonstrates technical & conceptual skills to analyze, consolidate, and synthesize knowledge toward strategic activities.
- 8. Demonstrates comprehensive skills in R&D or innovations in profession

Personal Skill Levels

- 1. Takes responsibility for learnings.
- 2. Uses stipulated learning guides and seeks guidance if needed
- 3. Sets one's own learning & work objectives
- 4. Initiates planning & designing technical learning objectives.
- 5. Takes responsibility for overall actions and outcomes.
- 6. Exercises autonomy & responsibility for planning and development of processes that support substantial changes.
- 7. Defines objectives for new applications reflecting on societal, economic, & cultural implications.
- 8. Selects appropriate means & develops new ideas & processes.

Social Skills Levels (Associates)

- 1. Respects others' actions & accepts critique and feedback.
- 2. Listens effectively & uses comprehension skills to receive direction & information
- 3. Helps shape the work within a heterogeneous, working /learning group.
- 4. Communicate solutions to moderately complex, controversial, sensitive matters.
- 5. Demonstrates advanced interpersonal abilities to convey complex facts to cross-disciplinary audiences.
- 6. Demonstrates ability to work with and lead expert groups.
- 7. Demonstrates ability to lead expert debates, build consensus, & promote professional development of others.
- 8. Leads groups in complex or interdisciplinary tasks, promotes organizational goals.

SECTION 2

Skill Boss Skills

The Skill Boss Skill Instruction CD includes the following list of 55+ skills, which are directly related to industry and the MSSC Standards. Many of these skills require prior knowledge of the topic before learning or performing the skill on Skill Boss. This prior knowledge is provided by the MSSC CPT e-learning (online) courses.

The following list of skills is the educational foundation for Skill Boss and will guide the class instruction and provide information for a school counselor scheduling students for the class. This list is also the conversation starter for the instructor to connect with their local industries. Industry buy-in provides employment possibilities for the students after the completion of this course.

Safety Skills of Skill Boss

- 1-1 Use an equipment manual to locate information
- 1-2 Identify machine components
- 1-3 Perform an electrical lockout/ tagout procedure
- 1-4 Perform a pneumatic lockout/tagout procedure
- 1-5 Install a machine guard
- 1-6 Perform a pre-startup inspection
- 1-7 Locate and interpret Safety Data Sheets
- 1-8 Interpret safety labeling on containers
- 1-9 Handle and store lubricants properly

Quality Practices & Measurement Skills of Skill Boss

- 2-1 Use a machinist rule to measure part dimensions
- 2-2 Use a tape measure to measure machine dimensions
- 2-3 Use a dial caliper to measure part dimensions
- 2-4 Use a micrometer to measure part dimensions
- 2-5 Measure a geometric feature of a part
- 2-6 Use a dial indicator to measure shaft runout

Production & Processes Skills of Skill Boss Hand Tools

- 3-1 Identify types of threaded fasteners
- 3-2 Use a combination wrench
- 3-3 Use a socket wrench
- 3-4 Use a combination wrench as a backup wrench
- 3-5 Use a hex key wrench
- 3-6 Use a straight slotted screwdriver
- 3-7 Use a Phillips screwdriver
- 3-8 Use a torque wrench

Machine Operation

- 3-9 Connect main air pressure
- 3-10 Power up a machine
- 3-11 Navigate HMI menus
- 3-12 Use an HMI to manually operate actuators
- 3-13 Operate a machine in single step mode
- 3-14 Operate a machine in automatic mode
- 3-15 Use an HMI to view production data
- 3-16 Perform a normal machine shutdown
- 3-17 Perform an emergency machine shutdown
- 3-18 Reset an alarm and restart machine
- 3-19 Measure cycle time using a stopwatch

Maintenance Awareness Skills of Skill Boss Check indicators for correct operation

- 4-1 Verify that PLC power and control indicators are correct
- 4-2 Verify that a PLC output operates the correct machine function
- 4-3 Verify that actuator sensors are operating correctly
- 4-4 Use a multimeter to check DC voltage of inputs and outputs

Adjust electro-pneumatic system

- 4-5 Set pneumatic regulator pressure
- 4-6 Adjust pneumatic lubricator drip rate
- 4-7 Use manual overrides to manually operate pneumatic valves
- 4-8 Use flow control valves to adjust actuator speed
- 4-9 Adjust vacuum cup pressure
- 4-10 Adjust stroke position of pneumatic actuators
- 4-11 Adjust a limit switch
- 4-12 Adjust a photoelectric sensor
- 4-13 Adjust an inductive proximity sensor
- 4-14 Adjust a magnetic reed sensor
- 4-15 Adjust the speed setting of an AC Variable Frequency Drive

Adjust mechanical systems

- 4-16 Install a pillow block bearing and shaft
- 4-17 Align and tension a basic chain drive
- 4-18 Align and tension a basic V-Belt drive
- 4-19 Assemble and align a flexible coupling and shaft

Maintain machines

- 4-20 Refill a pneumatic lubricator
- 4-21 Use a grease gun to lubricate a bearing
- 4-22 Drain an air filter
- 4-23 Replace an air filter element
- 4-24 Connect pneumatic circuit using a schematic

Machine Performance

• 4-25 Adjust machine to optimize cycle time
SECTION 3

Skill Boss Skills – MSSC CPT Curriculum Cross-Reference

The Skill Boss skills can be performed in parallel with the CPT online courses. The following cross-reference list shows when the skills should be performed in conjunction with the CPT online courses content to create a seamless hands-on experience for the students to earn their CPT+ Certificate from MSSC.

Notice that not all the Skill Boss skills have corresponding curriculum content in the CPT courses. The Skill Boss skills were developed to match the standards. Some skills, such as identifying machine components, do not necessarily require online curriculum content. However, some skills would benefit from content in the online courses, so MSSC plans to add content to the online courses at some point in the future. In the meantime, skills that do not have online curriculum content include additional instructions in the skill to teach any concepts needed to support the skill.

MSSC CPT Safety Module	Safety Skills of Skill Boss	
N/A	1-1 Use an Equipment Manual to locate information	
N/A	1-2 Identify machine components	
Safety Module 7 Hazardous Material Safety Obj. 8	1-8 Interpret Safety labeling on containers	
Safety Module 7 Hazardous Material Safety Obj. 11	1-7 Locate and Interpret Safety Data Sheets	
Safety Module 7 Hazardous Material Safety Obj. 12/13	1-9 Handle and store lubricants properly	
Safety Module 8 Tool & Machine Safety Obj. 3	1-5 Install a machine guard	
Safety Module 8 Tool & Machine Safety Obj. 5	3-17 Perform an emergency machine shutdown	
Safety Module 8 Tool & Machine Safety Obj. 7	1-3 Perform an electrical lockout/ tagout procedure	
Safety Module 8 Tool & Machine Safety Obj. 8	1-4 Perform a pneumatic lockout/tagout procedure	
N/A	1-6 Perform a pre-startup inspection	
Safety Module 8 Tool & Machine Safety Obj. 10	3-2 Use a combination wrench	
Safety Module 8 Tool & Machine Safety Obj. 10	3-3 Use a socket wrench	
Safety Module 8 Tool & Machine Safety Obj. 10	3-4 Use a combination wrench as a backup wrench	
Safety Module 8 Tool & Machine Safety Obj. 10	3-5 Use a hex key wrench	
Safety Module 8 Tool & Machine Safety Obj. 10	3-6 Use a straight slotted screwdriver	
Safety Module 8 Tool & Machine Safety Obj. 10	3-7 Use a Phillips screwdriver	
Safety Module 8 Tool & Machine Safety Obj. 10	3-8 Use a torque wrench	
MSSC CPT Quality Module	Production & Processes Skills of Skill Boss	
Quality Module 2 Blueprint Reading Obj. 9	3-1 Identify types of threaded fasteners	
	Quality Practices & Measurement Skills of Skill Boss	
Quality Module 4 Basic Measurement Obj. 7	2-1 Use a machinist rule to measure part dimensions	
Quality Module 4 Basic Measurement Obj. 10	2-2 Use a tape measure to measure machine dimensions	
Quality Module 5 Precision Measurement Tools Obj. 3	2-3 Use a dial caliper to measure part dimensions	
Quality Module 5 Precision Measurement Tools Obj. 8	2-4 Use a micrometer to measure part dimensions	
Quality Module 5 Precision Measurement Tools Obj. 9	2-4 Use a micrometer to measure part dimensions	
N/A	2-5 Measure a geometric feature of a part	
Quality Module 6 Dimensional Gauging Tools Obj. 6	2-6 Use a dial indicator to measure shaft runout	
MSSC CPT Manufacturing Processes Module	Production & Processes Skills of Skill Boss	
N/A	3-9 Connect main air pressure	
Mfg. Processes Module 6 Equipment Procedures Obj. 2	3-11 Navigate HMI menus	
Mfg. Processes Module 6 Equipment Procedures Obj. 3	3-10 Power up a machine	
N/A	3-12 Use an HMI to manually operate actuators	
N/A	3-13 Operate a machine in single step mode	
Mfg. Processes Module 6 Equipment Procedures Obj. 4	3-14 Operate a machine in automatic mode	
Mfg. Processes Module 7 Production Planning/Flow Obj. 2	3-15 Use an HMI to view production data	
N/A	3-16 Perform a normal machine shutdown	
Mfg. Processes Module 7 Production Planning Obj. 15	4-25 Adjust machine to optimize cycle time	
N/A	3-18 Reset an alarm and restart machine	
N/A	3-19 Measure cycle time using a stopwatch	
MSSC CPT Maintenance Module	Maintenance Awareness Skills of Skill Boss	

N/A	4-1 Verify that PLC power & control indicators are correct		
N/A	4-2 Verify PLC output operates the correct machine function		
N/A	4-3 Verify that actuator sensors are operating correctly		
Maintenance Module 3 Electrical Measurement Obj. 4	4-4 Use a multimeter to check DC voltage of inputs & outputs		
Maintenance Module 5 Pneumatic Power Systems Obj. 6	4-24 Connect pneumatic circuit using a schematic		
Maintenance Module 5 Pneumatic Power Systems Obj. 9 4-5 Set pneumatic regulator pressure			
Maintenance Module 5 Pneumatic Power Systems Obj. 11	4-22 Drain an air filter		
Maintenance Module 8 Bearings & Couplings Obj. 13	4-16 Install a pillow block bearing and shaft		
Maintenance Module 8 Bearings & Couplings Obj. 17	4-19 Assemble and align a flexible coupling and shaft		
Maintenance Module 8 Bearings & Couplings Obj. 22	4-21 Use a grease gun to lubricate a bearing		
Maintenance Module 9 Belt Drive Obj. 12	4-18 Align and tension a basic V-Belt drive		
Maintenance Module 10 Chain Drives Obj. 10	4-17 Align and tension a basic chain drive		
N/A	4-6 Adjust pneumatic lubricator drip rate		
N/A	4-7 Use manual overrides to operate pneumatic valves		
N/A	4-8 Use flow control valves to manually adjust actuator speed		
N/A	4-9 Adjust vacuum cup pressure		
N/A	4-10 Adjust stroke position of pneumatic actuators		
Maintenance Module 12 Machine Automation Obj. 8	4-11 Adjust a limit switch		
N/A	4-12 Adjust a photoelectric sensor		
N/A	4-13 Adjust an inductive proximity sensor		
N/A	4-14 Adjust a magnetic reed sensor		
N/A	4-15 Adjust the speed setting of an AC Variable Frequency Drive		
N/A	4-20 Refill a pneumatic lubricator		
N/A	4-23 Replace an air filter element		



New Mechatronics Education Initiatives

Dr. Marilyn Barger, National Science Foundation ATE Centers

Dr. Marilyn Barger is the Principal Investigator and Executive Director of FLATE, the Florida Regional Center of Excellence for Advanced Technological Education, funded by the National Science Foundation and housed at Hillsborough Community College in Tampa, Florida since 2004. FLATE serves the state of Florida as its region and is involved in outreach and recruitment of students into technical career pathways; has produced award winning curriculum design and reform for secondary and post-secondary Career and Technical Education programs; and provides a variety of professional development for SETM and technology secondary and post-secondary educators focused on advanced technologies. She earned a B.A. in Chemistry at Agnes Scott College and both a B.S. in Engineering Science and a Ph.D. in Civil Engineering (Environmental) from the University of South Florida, where her research focused on membrane separation science and technologies for water purification. She has over 20 years of experience in developing curricula for engineering and engineering technology for elementary, middle, high school, and post secondary institutions, including colleges of engineering. Dr. Barger has presented at many national conferences including American Association of Engineering Education, National Career Pathways Network, High Impact Technology Exchange, ACTE Vision, League of Innovation and others. Dr. Barger serves on several national panels and advisory boards for technical programs, curriculum and workforce initiatives, including the National Association of Manufacturers Educators' Council. She is a Fellow of the American Society of Engineering Education, a member of Tau Beta Pi and Epsilon Pi Tau honor societies. She is a charter member of both the National Academy and the University of South Florida's Academy of Inventors. Dr. Barger holds a licensed patent and is a licensed Professional Engineer in Florida.

Dr. Richard Gilbert, University of South Florida

Richard Gilbert is a Professor of Chemical and Biomedical Engineering at the University of South Florida's College of Engineering . Richard is the Co-PI for the grant that supports the NSF designated Center of Excellence for Advanced Technological Education in Florida, FLATE. FLATE, now in its 10 year of operation, addresses curriculum, professional development, and outreach issues to support the creation of Florida's technical workforce. Richard has over 30 years of experience working with the K-14 education community. Other funded efforts include projects for the NIH and the US Department of Education. The latter was for the development of an engineering curriculum for elementary school applications. The former is for development of electric field mediated drug and gene applicators and protocols. This effort has generated over 20 patents and cancer treatment protocols currently in Phase II trials.

New Mechatronics Education Initiatives in 2-year Programs

Abstract

The number of associate level degree programs in Mechatronics is growing rapidly across the country. These programs are trying to meet the increasing nationwide need for technicians that can install, maintain, troubleshoot, and service subsystems that often integrate pumps, motors, valves, sensor, and interface software that are responsible for the operation and/or control of manufacturing processes. These technicians are typically identified as mechanical, automation, robotics, and/or mechatronics technicians. These associate degree level programs are also aligning their curriculum with several international, industry valued credentials to best prepare the 2-year mechatronics technicians to be ready for work in the growing number of highly automated facilities across the country. This paper reviews several of these evolving programs; how they have updated electrical and/or mechanical technology programs to include current technology and industry workforce need; how the industry credentials are impacting their programs, students and employers; and their efforts to build capacity by partnering with local high schools to better meet the needs of employers in their communities.

Keywords

Mechatronics, manufacturing, education, technicians, automation, pathways, technical associate degree, 2-year, electromechanical, technician education

Historic Background

The term "Mechatronics" was first coined by Tetsuro Mori and was a trademark of Yasakawa Electric Corporation, the Japanese company he worked. Yasakawa Electric was involved with consumer products and their initial insertion of microprocessors into their purely mechanical systems marked a beginning of operating and controlling mechanical systems with electronic devices. The development and growth of sensor technologies with their inclusion of electromechanical systems extended and popularized the use of mechatronics as an inclusive term for this discipline. Today, core concepts of controlling a system with electronics and communication technologies is fundamental to mechatronics systems. Mechanical, electrical and electronic communications have continued to evolve at an accelerating rate during recent decades and manifest themselves in mechatronic systems.¹⁻²

Any robot also represents its own mechatronic system. The robot has a number of sensors that takes in information (e.g., a signal from a clock, verbal command, etc), processes that input signal to an analog or digital input command. Thee commands are delivered to an analog or digital controller that analyzes the situation based on expected values of these processed input signals. A different set of conditional signals are transferred to final control elements that are

integrated elements that are integrated into various parts of the robot to allow it to respond (e.g., make a series of movements, pick up an object, etc) with the expectation that this new set of actions will alter the sensors' next response to also meet an expected value(s).

The defense sector has been a leader in developing sophisticated mechatronics systems for military applications. Consumers have had relatively simple mechatronic systems (e.g., garage door openers, thermostats, controlled air conditioning, darkness activated lighting, low gas indicator lights in vehicles, and remote-controlled televisions, etc) in their homes for decades. Today, the Internet of Things (IoT) has taken mechatronic systems to the next step and allows us to control a variety of mechatronic devices from a single wireless dashboard like a smart home app on a cellular phone. Today, there are a growing number of sensors, smaller components (electronic, mechanical ad communication), increased sensor sensitivity and speed, robust data collection and analysis tools and a growing number and variety of communication platforms that are all available at lower and lower costs. Designing, building, operating, maintaining, and repairing these systems are task for mechatronic engineers and technicians.



Figure 1. Typical Illustration of Mechatronics

Snapshot of Mechatronics Technician Education

Unfortunately, there is no official occupation for Mechatronics Technicians in the Department of Labor, Employment and Training Agency (DOL ETA) Standard Occupation Classifications (SOC). The closest job titles currently listed are Robotics Technician (SOC 17-3024.01), Mechanical Engineering Technician (SOC 17-3027.00), Electro-mechanical engineering Technician SOC 17-3024.00). However, Mechatronics Engineer (17-2199.05) has recently been added³⁻⁴. In addition to the guidance colleges can get from these national occupation descriptions, the U.S. Department of Labor developed a Competency Model for Mechatronics shown in Figure 1⁵. The block diagram is surface icon for an in-depth list of competencies at each level moving up the pyramid that can be downloaded from the Career One Stop website in several formats. The yellow layers contain industry specific skills and knowledge and, therefore, provide specific information for mechatronics technicians with associate degree. The lower red levels provide information about fundamental knowledge in mathematics, language arts, and science. The bottom gray level defines employability and workplace skills. The competency model provides detailed information about the skill set that defines this occupation in a linked spreadsheet compiled by the ETA from industry responses.



Figure 2. US DOL Mechatronics Competency Model

Two-year technical programs prepare students to become mechatronics technicians and typically include more than 40 credit hours of a 60-90+ credit hour degree plan in technical, hands-on course work at a community or technical college. The degrees can be either Associate of Science or Associate of Applied Science depending on the degree definitions in different states and the institutions themselves. The programs include general education requirements that include fundamental math, language, science, social sciences and humanities courses, as well as core technology courses like electronics, safety, CAD /solid modeling, print reading, tools and instrumentation, and quality. Building on the fundamentals, courses at the second-year level include more electronics, mechanical drives and systems, fluid systems (hydraulic and pneumatics), programmable logic controllers, robotics, instrumentation and controls, and electric motors and capstone (culminating project). A review of over fifty associate level mechatronics programs in the United States revealed that over 90% of those programs had at least one course in each subject mentioned above as the "second year" courses. Local program "flavor" depends on regional industry needs and is expressed in other related courses that might be required or elective.

The future of mechatronics education is exciting and coming very fast. Many industries, including manufacturers, are rapidly adopting the technologies and communication platforms of Industry 4.0 for their production systems. The new term "Industry 4.0" was coined to capture the growing integration of cyberphysical systems, cloud computing, big data with sophisticated automated and autonomous systems. Integrating communications and artificial intelligence (AI) between the equipment and the industry's business enterprise system results in what is now being called a "smart factory". Because these technologies are already proven to be time-saving and efficiency-enhancing, industries are rapidly adopting and implementing these technologies. Colleges and universities will have to keep pace with this trend and graduate students who understand the depth and breadth of communications layers as well as the intricacies of the technology itself.

Example Programs

There are a number of very good and mature Associate Degree Mechatronics programs as well as several new and emerging programs across the country. This section will briefly review these. A generic/topical program outline can be found in the appendix of this paper.

Central Community College (CCC) is a multi-campus community college serving a 25-county area in central Nebraska (approximately 14,000 square miles) with a population of more than 300,000. The Mechatronics program (62-64 credit hours) has been in place for over 15 years and offers 2 course sequence specializations: Electromechanical/Mechatronics and Mechatronics Process Instrumentation and Control. CCC also offers four credit certificates in Automation, Control Systems, Fluid Power and Industrial Technology that are 12-14 credits of technical courses that are part of the Mechatronics degree plan. (http://www.cceneb.edu/Home/)

The College of Lake County (CLC) is developing a new mechatronics associate degree program based on industry requesting graduates with more experience in automated systems. The new degree is currently a 24-hour certificate under a strong Mechanical Engineering Technology Degree program. The new Mechatronics Degree will prepare students for the Siemens Mechatronics Certifications. CLC is working with Ann Arundel CC and Florida State College at Jacksonville (FSCJ) to develop a low cost mechatronics trainer for high schools and providing these with professional development to schools in their regions. CLC is located in northeast Illinois close to Lake Michigan. (http://www.clcillinois.edu/)

Hagerstown Community College (HCC) in Hagerstown, MD offers a newly updated Advanced Manufacturing Systems AAS degree and related shorter college certificate. HCC serves a variety of traditional manufacturing companies in a long-time manufacturing area in rural Maryland. Companies in this region are now adding more automated and advanced manufacturing technologies and the program is adding new motors and controls systems and integrated components communications. (http://hagerstowncc.edu)

Hillsborough Community College (HCC) located in Tampa, Florida offers a 30-credit hour Mechatronics college credit certificate that is housed within its Engineering Technology Associate Degree⁶. This program has over one hundred full and part-time students enrolled. Its Engineering Technology Core courses are aligned to the Manufacturing Skills Standard Council Certified Technician (MSSC-CPT) and the courses in the Mechatronics certificate are aligned to PMMI Mechatronics certification. (https://www.hccfl.edu/)

Motlow State Community College (MSCC) located in south middle Tennessee and offers a 63-credit hour Associate Degree. Motlow's graduates are prepared for the Siemens Mechatronics certifications. Motlow State serves as the first official Siemens Training Center in the United States making this certification more accessible to mechatronics students across the United States. (https://www.mscc.edu/)

Piedmont Virginia Community College (PVCC), located in Charlottesville, Virginia has a new focus on Mechatronics in a college career certificate within its Electronics and Computer

Technology Associate Degree. The career certificate is aligned to the Manufacturing Technician Level 1 (Manufacturing Skills Institute) and the Certified Mechatronic Systems Assistant (Siemens). (<u>https://www.pvcc.edu/</u>)

South Central College (SCC) is located in southern Minnesota and serves a wide range of industry including the packaging and agricultural sectors in that region. To best support these industry, South Central has developed portable trainers and remote access equipment to provide remote and working students access to this educational program (http://southcentral.edu/)

Virginia Western Community College (VWCC) is home to another well-established Mechatronics Associate Degree program that has had a big regional economic impact in and around Roanoke, Virginia. This program offers a college certificate as well as the degree and uses the college's Fab Lab to support student projects in all mechatronics courses. VWCC is also aligned to the Siemens certification and has help teachers in nearby manufacturing high school programs become certified as well as their own students. (http://virginiawestern.edu/)

Pathways to Bachelor's Degrees

There are a number of 4-year programs in Mechatronics Technology Engineering or General Engineering Technology that graduates of these example programs, among others, can easily continue their programs of study. Purdue Northwest University (formally, Calumet) and Texas A & M University both have strong bachelor's degree programs that accept 2-year mechatronics graduates. Graduates of Florida's Engineering Technology Associate Degree in Advanced Manufacturing (Mechatronics) will soon be able to use a statewide articulation to Daytona State College (DSC) to complete a bachelor's degree in Engineering Technology with mechatronics focus. The DSC program is a hybrid program offering flexibility for all students, especially working students. All courses in the program are offered online and all labs can be completed on campus but also have several off-campus options to complete. Additionally, there are a growing number of Mechatronics, Mechatronics Engineering or Mechatronics tracts in traditional mechanical, general or electrical engineering programs which may offer transfer opportunities for 2-year mechatronics students.

Online Communities

In many cases, the associate programs have a single full-time faculty, a part-time lab technician, and possibly a couple of adjunct faculty. Although passionate about teaching as well as their technology, they often work in an isolated environment. In order to help keep these educators up to date with technology, pedagogy, issues and trends, the Mechatronics Community Exchange (MCE) was formed as a "grassroots" online community that provides support to 2-year faculty involved in this technology the opportunity to share resources among mechatronics faculty and educators. The college faculty, program directors, deans, etc. discuss various topics that include new equipment, lab layouts, student projects, math requirements, online resources, hybrid and remote teaching, student recruitment and many others. The MCE meets online several times per semester web-based meeting platform and the topic and agenda for each meeting is determined by the group. These sessions are not webinars per se, but rather sharing sessions particular topics.

Occasionally an invited expert on a topic of interest joins the meeting to share his/her expertise and answer questions in the small group. The community is hosted and supported by FLATE, the Florida Advanced Technological Education Center of Excellence NSF ATE (#1204751), an NSF ATE Regional Center of Excellence, the PACE-ME NSF ATE project at Virginia Western Community College (NSF ATE #1400571) and the CollaborATE ATE project at the College of Lake County (NSF ATE #1601172). You can find out more online on the MCE webpage.

There is also a new and growing community of educators who have started a group with regular meetings, forums and webinars to share information and to build their bachelors level educational programs. This portal is sponsored and hosted by Quanser and National Instruments. Mechatronics Education (www.mechatronicseducation.org) is an online resource portal and forum let by mechatronics faculty in universities and baccalaureate degree offering colleges.

Summary

More new mechatronics programs are being started across the country to help address the national skills gap as more industry and industry sectors implement robotic and automated systems. Many of these emerging mechatronics associate degree programs are aligning themselves to industry validated national credentials to best prepare their students for work in high wage and in-demand jobs. These national credentials help keep the programs up-to-date and add national and international standards to the local industry needs. The national and international credentials also provide students and working technicians defined portable skillsets that industry across the country need. These mechatronics programs at all levels are the natural place for emerging technologies and trends and many are beginning to integrate Industry 4.0 concepts and the Internet of Things (IoT) into their programs.

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Appendix

Т	vnical	2-vear	Mechatron	ics Degree	(60-68)	credit]	hours)
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General Education: 15-18 credits (includes college math/algebra and science)				
Electronics 1	Applied Robotics	Quality Systems and Measurements		
Hydraulics/Pneumatics	Automated Systems	Advanced/Industrial Electronics		
Programmable Logic Controllers	Motors and Controls	Safety		

Mechanical Systems	Computed aided drafting	Lean Manufacturing
Internship/work experience	Possible electives	

PathTech LIFE (Learning, Interests, Family and Employment): Understanding Advanced Technology Students

Danielly Orozco, Will Tyson, Lakshmi Jayaram, Marilyn Barger

Florida Advanced Technological Education Center of Excellence, University of South Florida, University of South Florida, Florida Advanced Technological Education Center of Excellence

Abstract

Educators can create better learning experiences if they understand more about the students in their classrooms. In most two-year college technical courses and programs, student diversity is particularly high for most demographic characteristics including age, gender, ethnicity and socioeconomic background. The PathTech LIFE project seeks to understand how learning, interests, family, and employment (LIFE) experiences of two-year college students studying various engineering technology related disciplines impact their decisions to enroll, return for further coursework, and/or pursue a certificate or degree. Among other early results, one primary motivator for enrollment in the technical programs is a stronger, more stable and more secure career pathway for supporting the students' families. This paper represents a work in progress effort that will report on the initial data from a survey as well as the findings of from the "pilot" study conducted regionally in the greater Tampa Bay area.

Keywords

Engineering Technology, education, pathways, student motivators, research

PathTech Tampa Bay Background

In 2011, researchers in the Sociology Department at the University of South Florida began studying the education and employment pathways of students entering 2-year engineering technology programs through interviews of all stakeholders associated with the pathway. Graduates of these programs are engineering technicians and in high demand for high wage positions across the country. These technicians build, maintain, operate and troubleshoot automated equipment in a number of different industry sectors including manufacturing, energy, material handling, transportation and many more. This first targeted research project focused on career pathways from high school to 2-year programs and beyond to baccalaureate degrees or to the workplace in a five-county region that directly serves the University of South Florida in Tampa Bay.

Five state/community colleges were included in this initial project in which interviews were conducted with high school and 2-year college faculty; students at both levels; administrators at both levels; and industry partners of the various programs. The project team conducted 174 indepth qualitative interviews. The influencing factors defined by the interview results are summarized in the following diagram. The second diagram illustrates the emerging pathways for two-year associate engineering technician education. These results also supplied strong support for the direction and scope of the current project, PathTech LIFE.



PathTech LIFE Overview

The PathTech LIFE project was funded by the National Science Foundation (NSF) Advanced Technological Education (ATE) program in 2015 and seeks to understand how learning, interests, family, and employment (LIFE) experiences of two-year college students impact their decisions to enroll, return for further coursework, and/or pursue a certificate or degree. It is a partnership between the University of South Florida, Florida Advanced Technological Education Center (FLATE) at Hillsborough Community College and other ATE Centers and projects. This project expands the PathTech Tampa Bay to a national focus of community college students in advanced technology fields that are considered to be sub-disciplines of engineering technology using an in-depth online survey. A project pilot engaged with these colleges through appropriate Advanced Technological Education (ATE) grantees. The pilot survey instrument revealed a limited number of colleges in the spring of 2017. Preliminary data from this pilot informed a number of changes both in the survey questions themselves and the logistics of implementation that were modified during the summer of 2017 and are implemented in the national survey deployed in September 2017.

PathTech LIFE Survey Topics and Strategies

Colleges with engineering technology programs were recruited through the NSF ATE centers and projects. College program that achieve milestones in percent participation get a stipend and/or a specific program report. The survey delves into a number of aspects of students personal, student and professional lives with questions covering academic background, college experiences, employment background and current status, motivation for enrollment, program evaluation, academic and career goals and demographics. To entice students to participate in the 15-minute survey, each student responding to the complete survey receives \$25.

Pilot Survey Results

A small pilot of 528 students from 26 different colleges responded to the survey between April 3 and May 2, 2017. Students identified with engineering technology programs that were categorized as focused on energy and the environment, advanced manufacturing, micro and nano technologies, general engineering technology or none of the above. The survey results indicated that Most students were between the ages of 18 and 30 years old, with 84% of respondent identifying as male. Demographic data also revealed that 63% identified as white. Employment information revealed that only 34% of students employed full time had jobs in their field of study while 48% of part time students have positions in engineering technology. Most students are happy with their program and acknowledged that the class offerings accommodate their work schedule. Additionally, 71% had an associate degree as their goal with 55% of all respondents having a long-term goal of a bachelor's degree and to stay in the engineering technology field.

Student Motivation

A number of survey questions addressed student's motivation to enrolled in their specific program. Students were asked to select from a list of sixteen items any/all that motivated them to enroll in the program. These results were analyzed using the PRISM Decision Model for Adult Enrollment (Stein & Wanstreet, 2006). PRISM categorizes 16 different responses in one of four categories: Pathway to a Better Life, Reflective Learner, Synchronizing Learning, Earning, and Living, and Match with an Academic Life. A strong majority of respondents wanted to increase their opportunities for a better life, a response that falls into the PRISM "Pathway to a Better Life" category. Least important motivator in this pilot was "wanting to improve my self-esteem", which also falls into the category "Pathway to a Better Life". The responses to the various student enrollment motivation questions were further distilled to five reasons for why students enrolled as identified by demographic categories. These categories are:

- Personal well-being
- Academic effort
- Skill building
- Job and financial concerns
- Family and other concerns

Next Steps

As a work in progress, the survey was slightly revise after the spring semester pilot and reopened in the fall of 2017. Most notably, a few questions were modified slightly for clarity and the survey was reduced from 25 to 15 minutes to enhance completion by students. After the University IRB (Instructional Review Board) approved revised survey, the survey was re-opened and an aggressive student recruitment campaign began. The goal is to get at least 2,000 student responses from across the country and conduct the same analysis of the data. A national summary as well as regional and individual college reports will be generated where there is a significant sample size and response rate.

Project Impact

Individual college reports on their student responses can inform local educators about their student population with reliable statistical data about their students. This can certainly lead to a better understanding of the students a particular college is serving and provide some context and comparison with other colleges (similar or dissimilar) as well as the national norm. One anonymous faculty member in a strong and mature A.S. Engineering Technology degree program participating in the survey observed: "We have to be aware of and deal with the fact that many of the students enrolled in our programs are just one paycheck away from some kind of financial disaster." How faculty support their students through these "life events" is critical to their completion of the courses and/or programs as well as their future career success. Success of our students is vital for the students as well as the industries we server. The research team is planning a longitudinal study of a small group of those surveyed in PathTech LIFE.

References

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