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What is PathTech?

- “Successful Academic and Employment Pathways in Advanced Technologies,” or PathTech, aims to better understand pathways into technician education and careers from high school and community college levels
- This project is led by an interdisciplinary team of researchers from the University of South Florida (USF) and the Florida Advanced Technological Education Center (FLATE) at Hillsborough Community College
- The PathTech qualitative team is currently conducting interviews with high school and community college students, instructors, and administrators, as well as with members of the Tampa Bay high-tech manufacturing industry to develop a deeper understanding of the experiences of students and workers in technician fields
- The PathTech quantitative team is analyzing education and employment administrative data from the Florida Department of Education to better understand the educational experiences that predict entry into technician careers



Will Tyson (PI), Marilyn Barger (FLATE Executive Director), and Rebekah Heppner (Qualitative Consultant) tour Draper Laboratory in St. Petersburg, May 2013

Engineering Technology in Florida

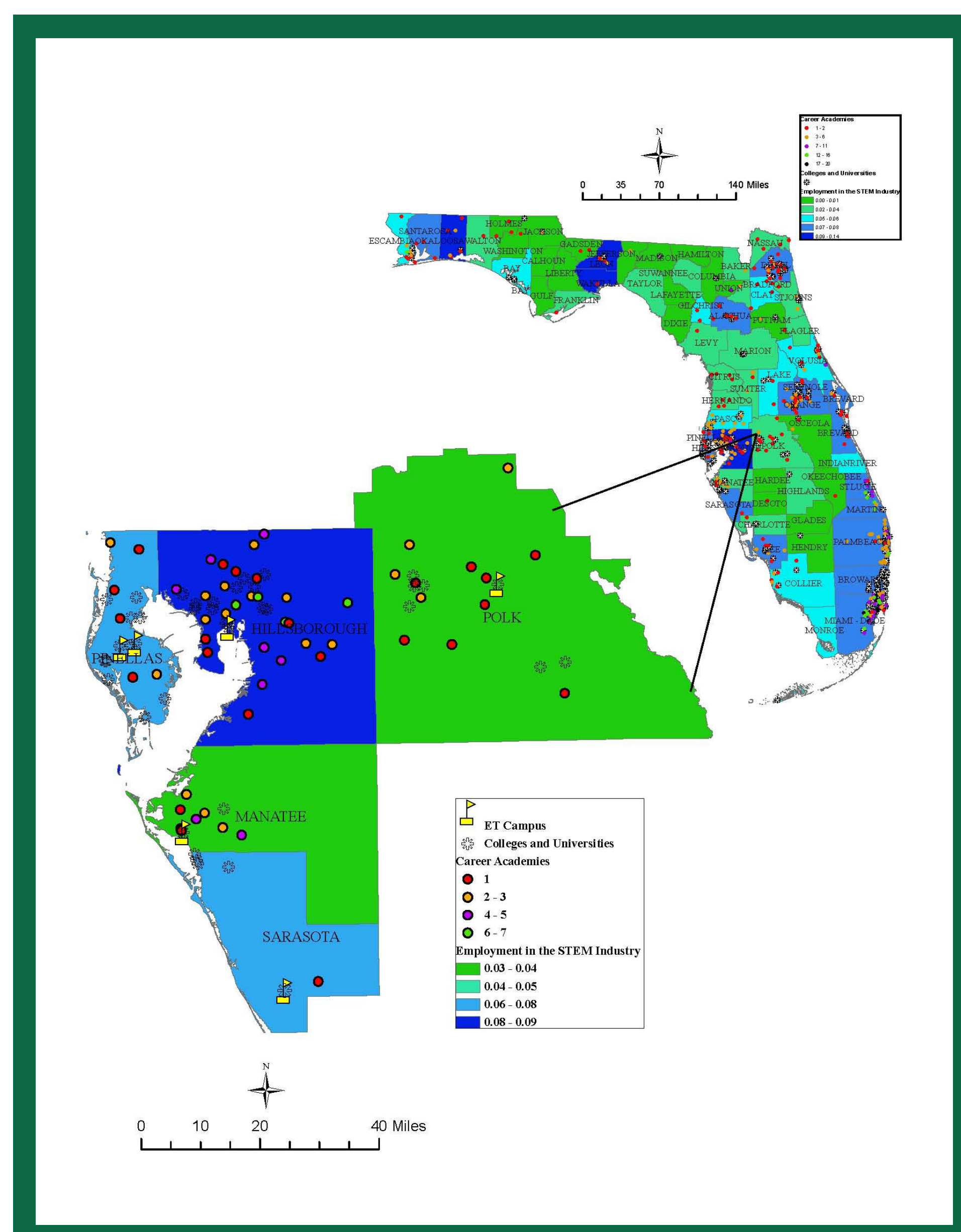


Figure 1. ET Community Colleges, High Schools, and Industry in Southwest Florida

Research Agenda and Mixed Methods Design

This research project utilizes mixed methods to understand recruitment and pathways into Engineering Technology (ET) programs, and link ET education programs with industry careers. Our in-depth interviews are recorded, transcribed and thematically coded in ATLAS.ti. Our qualitative team asks:

- High school and community college students to describe what prompted their interest in ET, how they learned about ET programs, the factors that influence their enrollment in their program, ET coursework and curriculum, and their future plans
- ET program administrators about the development and key elements of ET programs, the type of students these programs attract and retain, how they support their graduates in pursuing employment opportunities
- Local employers to share how they recruit and hire workers, and their perception of the skills and knowledge that would be essential for the future workers in this field

Our quantitative analyses use education and employment data from the Florida Department of Education to:

- Develop an educational profile of high school students who enroll in ET and manufacturing AS/AAS programs
- Compare educational and employment outcomes among students who are in: 1) AS/AAS programs, 2) other community college programs, 3) four-year BA/BS program, or 4) enter the workforce from high school
- Analyze ET course completion versus degree completion among students currently/recently in the workforce

Findings

- Specific life experiences lead to pathways into ET, such as having an inclination towards building and fixing things, high school CTE coursework and extracurricular opportunities, and work experiences in manufacturing and electronics.
- The majority of students enrolled in the ET program because a friend, partner, or coworker told them about it. Students often spent substantial amounts of time doing internet research to learn more about the courses offered and the field in general. Students also discussed recruitment visits at military installations.
- One area of frustration was high school counselors' lack of knowledge about associate's degree programs in technician education as students wished they had known about it sooner in their educational careers. Students also share some confusion over the differences between engineering and engineering technology. While many talk about becoming an engineer, often the actual work they are describing involves technical tasks and processes.

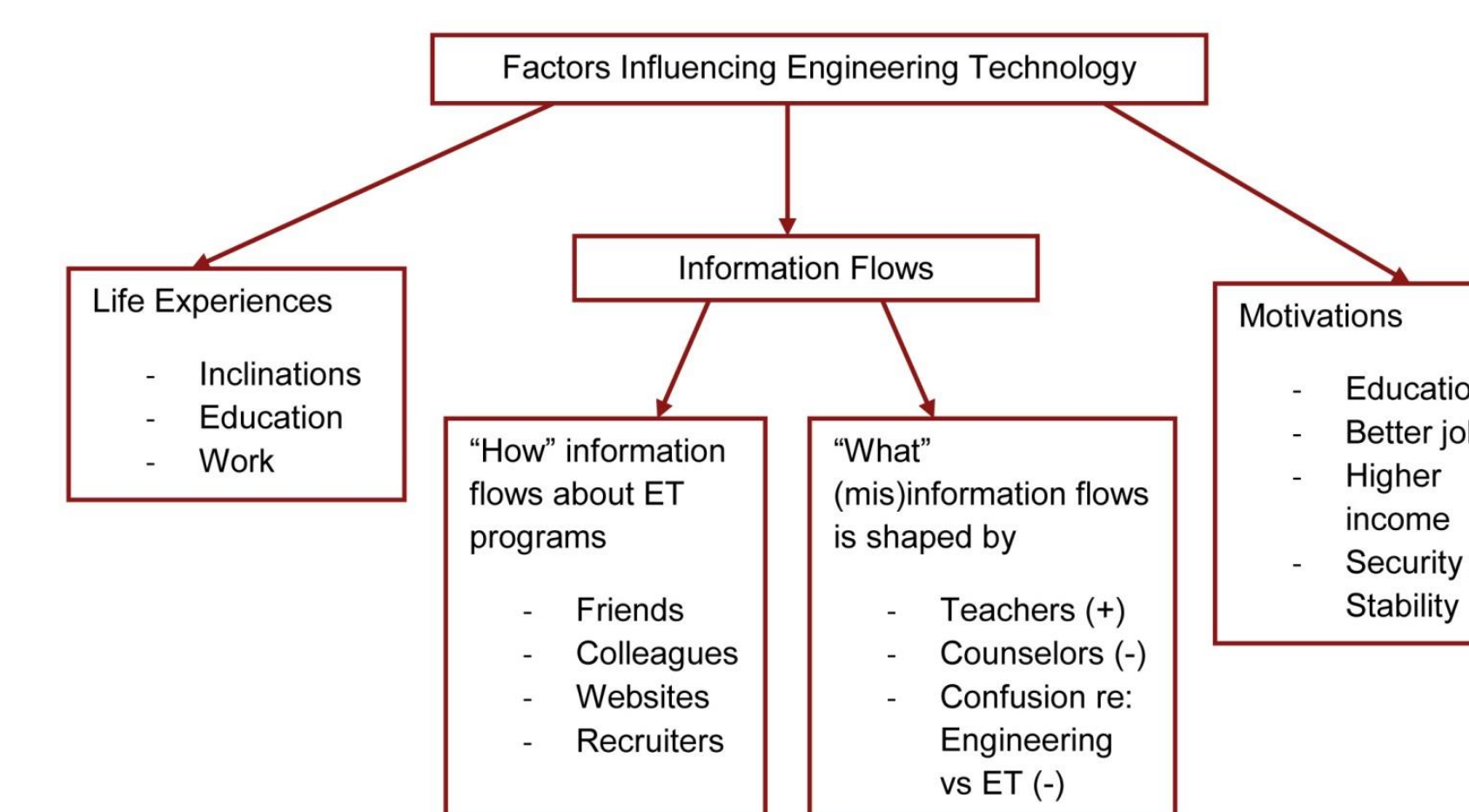


Figure 2. Factors Influencing Engineering Technology

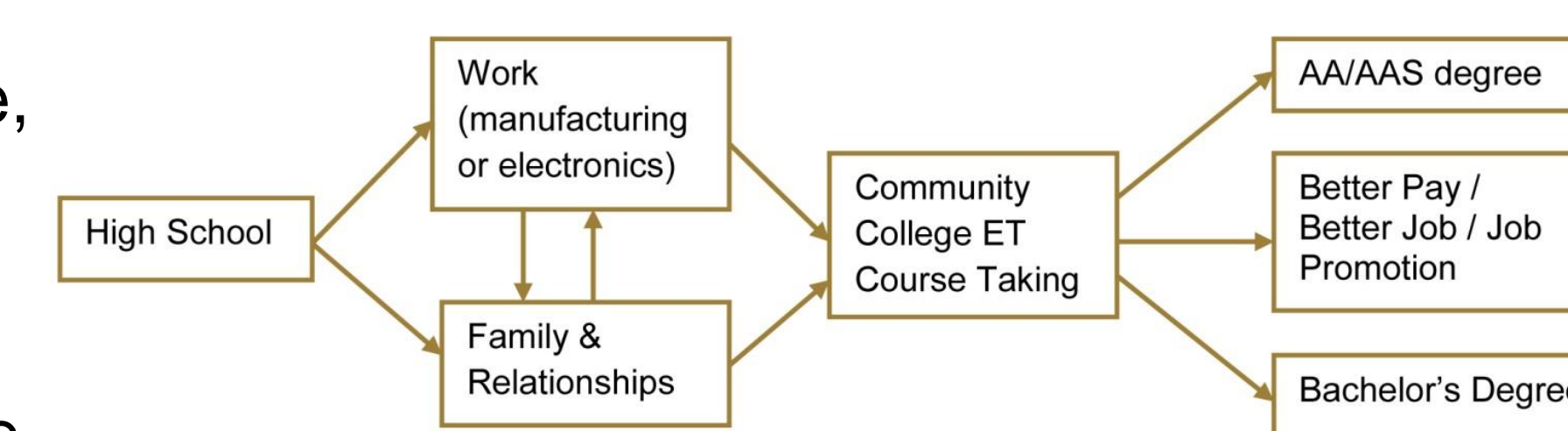


Figure 3. Emerging Pathways

- Instructors are instrumental in attracting students as well as motivating them to continue on the ET pathway. For example, high school students agree that the best aspect of their program is their instructor and community college students discuss how they just keep taking classes with the same group of instructors, that it does not even matter what the course is anymore.
- Students described factors that motivated them to seek degrees and/or credentials in ET. They discussed hopes for social mobility, higher pay, better jobs, as well as the possibility for the two-year degree to lead towards a bachelor's degree one day. This theme is critical to note because all of the community college students in the pilot study were returning to school many years after completing high school. This age demographic appears consistent across programs in ET in the Tampa Bay area. These students went straight into the workforce or military after high school and most already had experience in manufacturing or similar industry. Their return to school was often marked by a job loss and/or need for re-skilling, especially using advanced technologies, in order to be marketable and valued in the current economy. These older students also often have partners and children, and many discuss their need to provide for their families as a key element motivating their desire to enter and complete the ET program.

Community Impact and Intellectual Merits

As the global economy moves forward in our high-tech world, understanding of the experiences of students and workers in technician fields is vital to sustain necessary workforce development as well as improve the life chances of individuals and the stability of their local communities. PathTech seeks to inform stakeholders at each level about the efficacy of local engineering technology (ET) programs in order to promote ET pathways. We also hope to better equip FLATE and partner community colleges with information based on the personal experiences of students who are enrolling and not enrolling in these programs. With this information, we will work with FLATE to develop recommendations on how best to serve these audiences.

In addition to STEM, our research findings make a significant impact to the disciplines of sociology of education and educational anthropology. As local economies have experienced significant shifts and dramatic changes in recent decades, the movement of jobs and people has grown, and new industries have emerged. Central to these dynamics has been the role of technology, particularly in production processes. While bodies of literature have examined these phenomena, these studies largely reside within disciplinary boundaries and within the towers of the academy.

The PathTech research model utilizes interdisciplinary frameworks and multiple methodologies, with a focus on collecting and analyzing data from various sources and levels, all in shared partnership with schools, industry, and community. This approach provides a bold and innovative way of doing social science research on workforce topics crucial to our society that moves beyond disciplinary and academia, and into classrooms, boardrooms, and policy conversations.

Preliminary Policy Suggestions

Based upon findings from our qualitative pilot study, we offer the following policy suggestions to community colleges:

- Develop highly informational websites to improve the information flows about both what technician education is, as well as how to enter and succeed in these programs
- Focus recruitment efforts on mid-career individuals seeking to re-skill and/or develop technical expertise to re-enter the workforce
- Work specifically with high school counselors to improve their knowledge of the differences between engineering and engineering technology and the many opportunities for technicians in the current economy

Based on the pilot data, we also make suggestions for improving the pathway from high school into post-secondary technician education programs:

- Offer more information about financial assistance, including scholarships, grants and loans
- Promote existing dual enrollment programs and explore partnerships between high schools and community colleges; this allows high school students to gain industry certifications that could serve as a pathway to technician jobs
- Offer co-op opportunities to help students understand and experience technician work
- Develop a professional network for technician educators that specifically connects high school CTE instructors with community college ET instructors to create “feeder” high school programs for associate's degrees in ET.

USF PathTech Team and Contact Information

PathTech Team:

- Chrystal A. S. Smith, Ph.D. (Anthropology) - Project Manager
- Edward Fletcher, Ph.D. (Education) - Quantitative Investigator
- Rebekah Heppner, Ph.D. (Anthropology) - Qualitative Consultant
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Contact Information and Social Media:

- PathTech Web site: <http://sociology.usf.edu/pathtech/>
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