

Writing Effective Recruitment & Retention Plans for your NSF ATE proposal

The information provided is extracted from NSF publications or comes from presenters' knowledge and experience as ATE PIs. It does not speak for the National Science Foundation



Live Webinar
Wednesday, June 22
2:00 - 3:00 p.m. ET





Getting Started

- Using the chat box, tell us how many viewers are in the room with you
- Ask questions in the chat
- Questions will be answered during the webinar
- Change the view in the upper right-hand corner





Housekeeping

- Registered participants will receive a link to the webinar recording
- Registered participants will receive an e-mail with any attachments shared in Chat
- Typically happens within one week of the broadcast
- Tutorial based on the webinar will be published in the *Resource Library* on Mentor-Connect.org
- Tutorial includes the PowerPoint slides with annotated text



Welcome and Introductions



Elaine Craft, Principal Investigator
Mentor-Connect: Leadership Development and Outreach for ATE
Florence-Darlington Technical College, SCATE Center of Excellence
Email: Elaine.craft@fdtc.edu



Terry Bartelt, Involved in over 15 grants including NSF ATE projects.
Author of 3 textbooks, instructor emeritus at Fox Velley Technical College
Email: barteltt@gmail.com



Esperanza Zenon, Professor, River Parishes Community College,
PI - Advanced Industrial Instrumentation Control Technician Training
Email: ezenon@rpcc.edu



Program Solicitation

“The ATE program is interested in projects addressing issues in rural technician education and projects that broaden the diversity of the entry-level technical workforce including strategies to recruit veterans into technician education programs.”



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+



What proposals say:

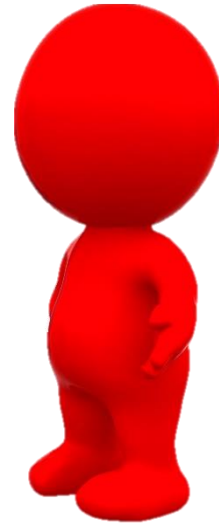
We are going to increase female enrollment



We will recruit more veterans



We will broaden participation





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+



The Problem

- “Generic “broadening participation” is less convincing than a plan that targets specific underserved or underrepresented populations.
- Also include retention plans. How do you keep the students once attracted to your program?





What to Include

- Diversity goal/objectives supported with data (current situation and specific target metrics for improvement)
- Specific target audiences that are appropriate for your locale and project
- Both current and recent past enrollment and demographic information
- Make-up of college's enrollment and community demographics
- What type of diversity will you seek to improve



+0101101
+



Considerations

- Didn't know what I didn't know
- Make use of resources
- You can include experts in your budget





**MENTOR
CONNECT**

RRPCC

Esperanza Zenon





Advanced Industrial Instrumentation Control Technician Training

RPCC will deconstruct and redesign the existing Industrial Instrumentation degree program by working closely with industry partners to develop an Introduction to IoT course and an Industry 4.0 capstone course to enrich the new degree program



ATE Proposal Outcome #3

Integrating core STEM modules to address the academic needs of a diverse, rural student population.

Recruitment and Retention

- NAPE PIPE* STEM- Equity Gap Analysis
- Open Educational Resources (OER) STEM Modules

* NAPE - National Alliance for Partnerships in Equity
PIPE - Program Improvement Process for Equity

ATE Proposal Language



This project will address STEM integration for diverse populations, creating an inclusive and skilled technical workforce that “encourag[es] broader representation in STEM fields, [crossing] lines of gender, ethnicity, and socio-economic status [which] has been shown to improve decision-making, solve problems more efficiently, and build better products” (Hook, 2015). Understanding the need for and the benefits of a more diverse workforce is a key component of addressing the needs of diverse, rural students pursuing degrees in technical education fields.

To increase diverse enrollment in technical education fields, this project proposes to use strategies outlined in the five Modules of the National Alliance of Partnerships in Equity (NAPE) STEM Equity Pipeline Project, based upon NSF Grant No. HRD-0734056 and Grant No. HRD 1203121, to increase the participation of underrepresented populations in the Industrial Instrumentation and Process Technology degree programs.

NAPE PIPE



- ❑ NAPE and its partners use a five-step Program Improvement Process for Equity™ (PIPE; formerly the Five-Step Improvement Process) that is based on practical yet rigorous methods and tools to guide state and local efforts to improve access, equity, and diversity in nontraditional occupations and STEM fields.
- ❑ Through a 5-step process—*Organize, Explore, Discover, Select, and Act*—PIPE engages teams of administrators, teachers, and counselors in conducting a student data-based performance gap analysis, identifying root causes for the gaps, and developing an action plan based on research-based strategies proven to close the identified gaps. (napequity.org)



PIPE-STEM™: Equity Gap Analysis

Completed So Far

- Organize: Team consisting of PIs, Institutional Research, Workforce
- Explore: Gather data
- Discover: Data showed major gap in female enrollment/completion

To-Do

- Select: Hypothesis based on investigating root causes for gaps
- Act: Experiment (Action Research)
- napequity.org



Proposal Language: STEM Modules

The Mathematics and Physical Science departments at RPCC, under the direction of Principal Investigator Dr. Esperanza Zenon, will develop portable Open Educational Resources (OER) STEM modules that will be used to support the RPCC Industrial Instrumentation and Process Technology degree programs as well as other technical courses across the Louisiana Community and Technical College System.

OER modules on fundamentals such as Basic Math Topics, Fluids, AC and DC circuits, Physics Fundamentals, and Solid States and Systems will be created using resources from Engineering Technology: Simulations for Learning, developed by Eastern Iowa Community Colleges as a result of a 2018 Department of Labor grant.

Other OER resources from the PhET Interactive Simulations project at the University of Colorado Boulder, Skills Commons, Wisc-Online created by Wisconsin's Technical Colleges, and 180 Skills will also be used.

All modules will be reviewed by RPCC's Online Course Evaluation Committee using Quality Matters standards and shared with other LCTCS colleges via Canvas Commons. These modules will provide an effective method to bolster STEM capabilities and present a cost-savings to students.



Requirements

- Open Source
- Portable
- Provide cost savings to students
- Aligned with Curriculum Needs
- Appropriate level for Students
- Reviewed - Quality Matters
- Accessible

Number Systems

Objectives

Activities

Course Materials



Activities and Assignments:

- Read: **All About Circuits Textbook - Digital** [\(https://www.allaboutcircuits.com/textbook/digital/\)](https://www.allaboutcircuits.com/textbook/digital/)
- Practice: **Binary Subtraction** [_ \(https://www.wisc-online.com/learn/mathematics2/number-systems/tmh3503/an-algorithm-for-binary-subtraction\)](https://www.wisc-online.com/learn/mathematics2/number-systems/tmh3503/an-algorithm-for-binary-subtraction)
- Practice: **Engineering Notation** [_ \(https://www.wisc-online.com/learn/general-education/technical-math/tmh9414/converting-values-in-engineering-notation\)](https://www.wisc-online.com/learn/general-education/technical-math/tmh9414/converting-values-in-engineering-notation)
- Practice: **Identifying Engineering Notation** [_ \(https://www.wisc-online.com/learn/general-education/technical-math/tmh9314/identifying-engineering-notation\)](https://www.wisc-online.com/learn/general-education/technical-math/tmh9314/identifying-engineering-notation)
- Practice: **Converting Octal Numbers to Decimals** [_ \(https://www.wisc-online.com/learn/mathematics2/number-systems/tmh6006/an-algorithm-for-converting-an-octal-number-t\)](https://www.wisc-online.com/learn/mathematics2/number-systems/tmh6006/an-algorithm-for-converting-an-octal-number-t)
- Practice: **Converting a Decimal to a Hexidecimal** [_ \(https://www.wisc-online.com/learn/general-education/technical-math/tmh5406/an-algorithm-for-converting-a-decimal-number\)](https://www.wisc-online.com/learn/general-education/technical-math/tmh5406/an-algorithm-for-converting-a-decimal-number)
- Practice: **Converting a Hexidecimal to a Decimal** [_ \(https://www.wisc-online.com/learn/general-education/technical-math/tmh6207/an-algorithm-for-converting-a-hexadecimal-num\)](https://www.wisc-online.com/learn/general-education/technical-math/tmh6207/an-algorithm-for-converting-a-hexadecimal-num)
- Practice: **Converting from Standard Form to Engineering Notation** [_ \(https://www.wisc-online.com/learn/general-education/technical-math/tmh9214/converting-numbers-from-standard-form-to-engi\)](https://www.wisc-online.com/learn/general-education/technical-math/tmh9214/converting-numbers-from-standard-form-to-engi)
- Practice: **Converting a Decimal to an Octal Number** [_ \(https://www.wisc-online.com/learn/mathematics2/number-systems/tmh5306/an-algorithm-for-converting-a-decimal-number\)](https://www.wisc-online.com/learn/mathematics2/number-systems/tmh5306/an-algorithm-for-converting-a-decimal-number)
- Practice: **Converting Binary Numbers to Decimals** [_ \(https://www.wisc-online.com/learn/technical/electronics-digital/dig902/binary-to-decimal-number-conversion\)](https://www.wisc-online.com/learn/technical/electronics-digital/dig902/binary-to-decimal-number-conversion)
- Practice: **Subtracting Binary Numbers 2's Complement** [_ \(https://www.wisc-online.com/learn/general-education/technical-math/tmh9514/subtracting-binary-numbers-by-adding-the-2s-c\)](https://www.wisc-online.com/learn/general-education/technical-math/tmh9514/subtracting-binary-numbers-by-adding-the-2s-c)
- Practice: **Hexidecimal Subtraction** [_ \(https://www.wisc-online.com/learn/mathematics2/number-systems/tmh3703/an-algorithm-for-hexadecimal-subtraction\)](https://www.wisc-online.com/learn/mathematics2/number-systems/tmh3703/an-algorithm-for-hexadecimal-subtraction)
- Practice: **Octal Subtraction** [_ \(https://www.wisc-online.com/learn/mathematics2/number-systems/tmh3603/an-algorithm-for-octal-subtraction\)](https://www.wisc-online.com/learn/mathematics2/number-systems/tmh3603/an-algorithm-for-octal-subtraction)
- Assessment: **Basic Logic Gates** [_ \(https://www.allaboutcircuits.com/worksheets/basic-logic-gates/\)](https://www.allaboutcircuits.com/worksheets/basic-logic-gates/)
- Assessment: **Boolean Algebra** [_ \(https://www.allaboutcircuits.com/worksheets/boolean-algebra/\)](https://www.allaboutcircuits.com/worksheets/boolean-algebra/)

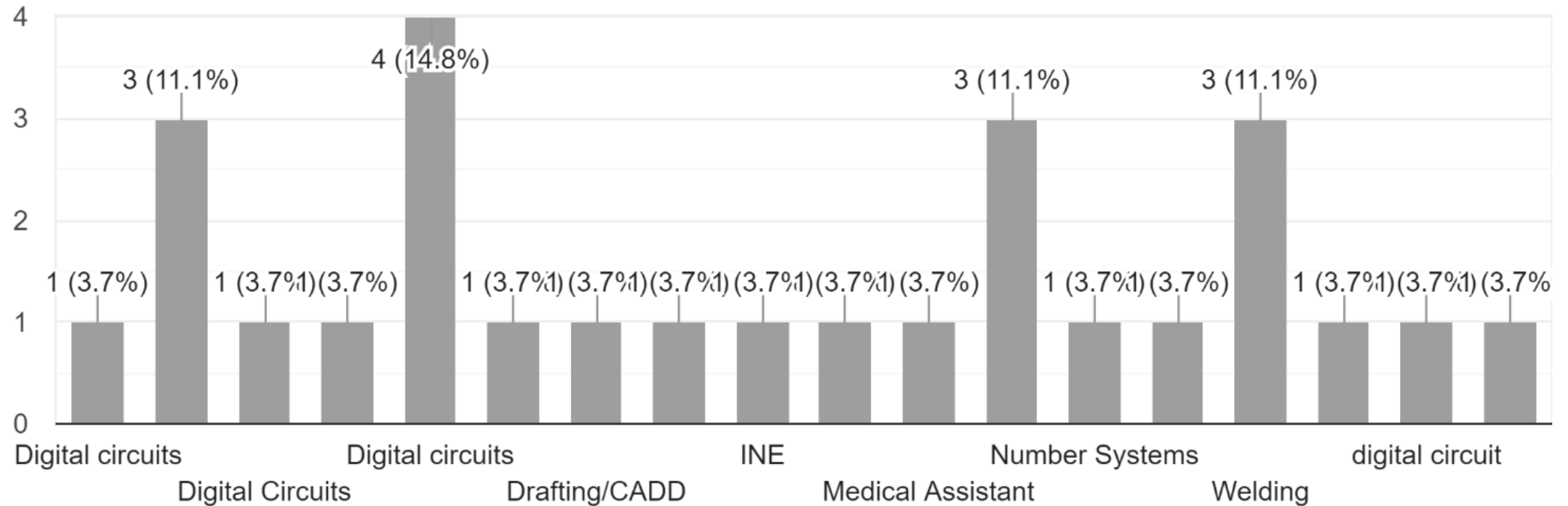
Example: STEM Module



Closing the Loop: Data STEM Modules

What course are you taking this survey for:

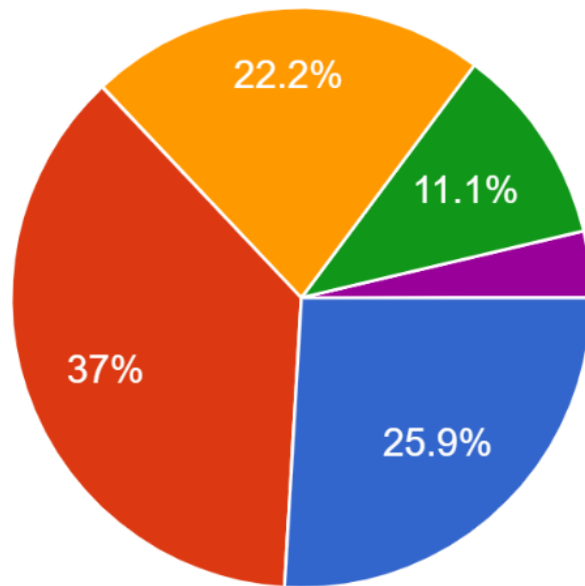
27 responses





How often did you use the free tutorial/optional resources for this course during the semester?

27 responses

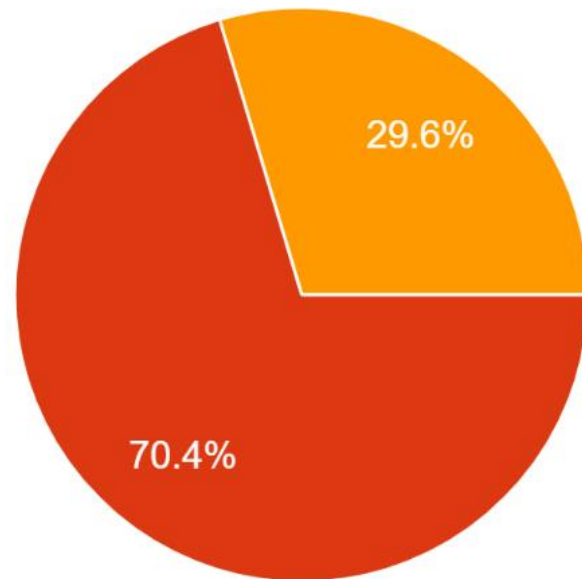


- Never
- 2-3 Times a Semester
- 2-3 Times a Month
- 2-3 Times a Week
- Daily



How would you rate the quality of the free tutorial/optional materials used for this course?

27 responses

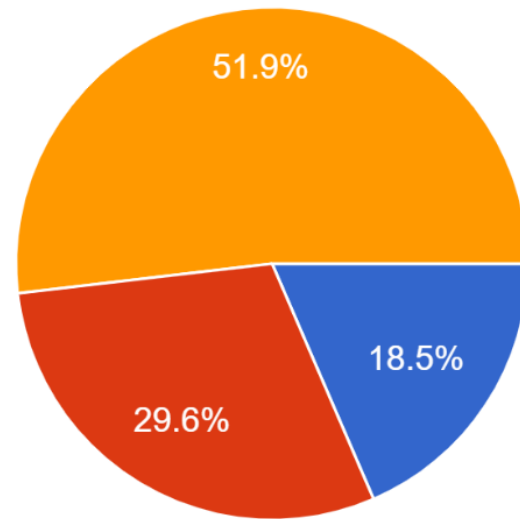


- WORSE than the quality of the texts in my other courses
- About the SAME AS the quality of the texts in my other courses
- BETTER than the quality of the texts in my other courses



How do you feel about the online format of the free tutorial/optional resources used for this course?

27 responses

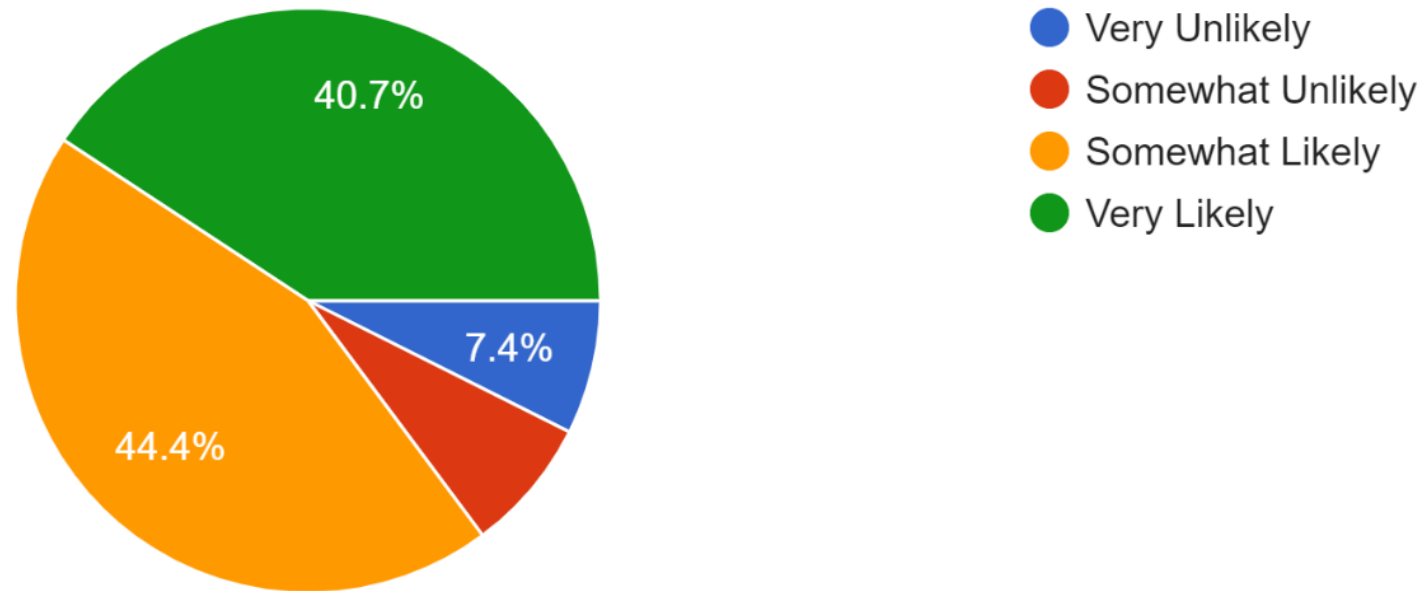


- I like the online format LESS than traditional printed texts
- I like the online format MORE than traditional printed texts
- I have no preference



How likely are you to register for a future course with open materials -- free, online materials like those used in this course?

27 responses





Reminder

- Put your questions in the chat box
- We are collecting them and will answer questions at the end of the webinar





Terry Bartelt



10 Tips to Program Building Think Outside the Box

Electromechanical Low Enrollment Dilemma



Non-Traditional Recruitment Requirements



- Faculty take ownership of program building
- Make an effort to recruit when the opportunity arises

Goal: 1 Student per Week



College Career Counselors who meet with incoming recruits

- **Invite** them to your annual advisory committee meeting
- **Attend** their meeting once a year to explain changes to program



College Career Counselors who meet with incoming recruits



- Show up at their office area **once** a month
- Go to their office to thank them after bringing a student to the lab for a **Tour**






**Have a tour
that is
interesting
and
informative**





- # Provide a handout that includes:
- Salaries
 - Companies who hire
 - Types of jobs
 - Other work information

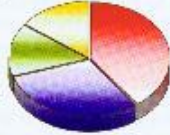
ELECTROMECHANICAL TECHNOLOGY PROGRAM

 Fox Valley Technical COLLEGE

Information You Can Use

What is Electromechanical Technology ?

15% Fluid Power
Hydraulics/Pneumatics



35% Electronics

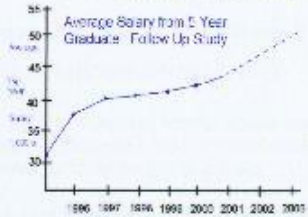
35% Computer Controlled Systems

Over 20 job listings for each graduate.

Starting wages have been #1 or #2 for the previous 3 years and within the top 5 of all 64 programs in the entire school over the last 20 years.
(See the graduate placement report for more details.)

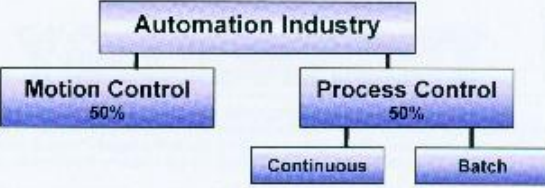
Scholarships are also available targeted for just the Electromechanical Technology student from major industries in our part of the state.

100 % Placement



Average Salary from 1 Year Graduate Follow Up Study

First in the state to offer training in process control as well as motion control.



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graph TD; A[Automation Industry] --> B[Motion Control 50%]; A --> C[Process Control 50%]; C --> D[Continuous]; C --> E[Batch]
```

Motion Control (examples)

- Parts Insertion
- Packaging
- Business Machines
- Machine Tool
- Graphic Arts

Continuous Process (examples)

- Paper Production
- Waste Water Treatment
- Plastic Production

Batch (examples)

- Food Industry
- Foundries
- Chemical Industry



Dear Jesse:

It was a pleasure to meet you yesterday. During the brief time we had to describe the Electromechanical program, a large amount of information was presented. It is very likely that I forgot to mention something, or you may have thought of a question after leaving the school.

**After the tour,
send a follow-up letter
the next day**

I invite you to please call me at (920) 991-3311 if you would like to have another discussion to clarify any questions that you may still have. I want to make sure that we provide you with the information you need to make a correct decision about your future. The Electromechanical program is a very challenging yet very rewarding program. I am confident that you will do very well, we look forward to serving you in the future.

Sincerely,

Start with 10 minute
individual bonding
session the **first 2**
days of the semester



Stay engaged with students



Dear Wellington:

This letter is just a friendly reminder that Fall Classes will be starting on August 20th.

There is still plenty of time to sign up for your class or classes. We are encouraging everyone to utilize the online registration. Go to fvtc.edu and click on the registration and follow the prompts. You may also call in your registration at 1-800-735-3882 or come in person and sign up.

I invite you to phone me at (920)996-2802 if you would like to have another discussion with me. We have advisors who will be available to help you make decisions that we provide all the information you need to make a correct decision about your future. You may also contact Judy Hohnberger at 735-2554.

We look forward to serving you this Fall.

- Be an advisor before students sign up for next semester courses
- Send letters to returning students in the summer (phone the students who you think may drop out)

Capitalize on college partners interested in collaboration





Time Commitment

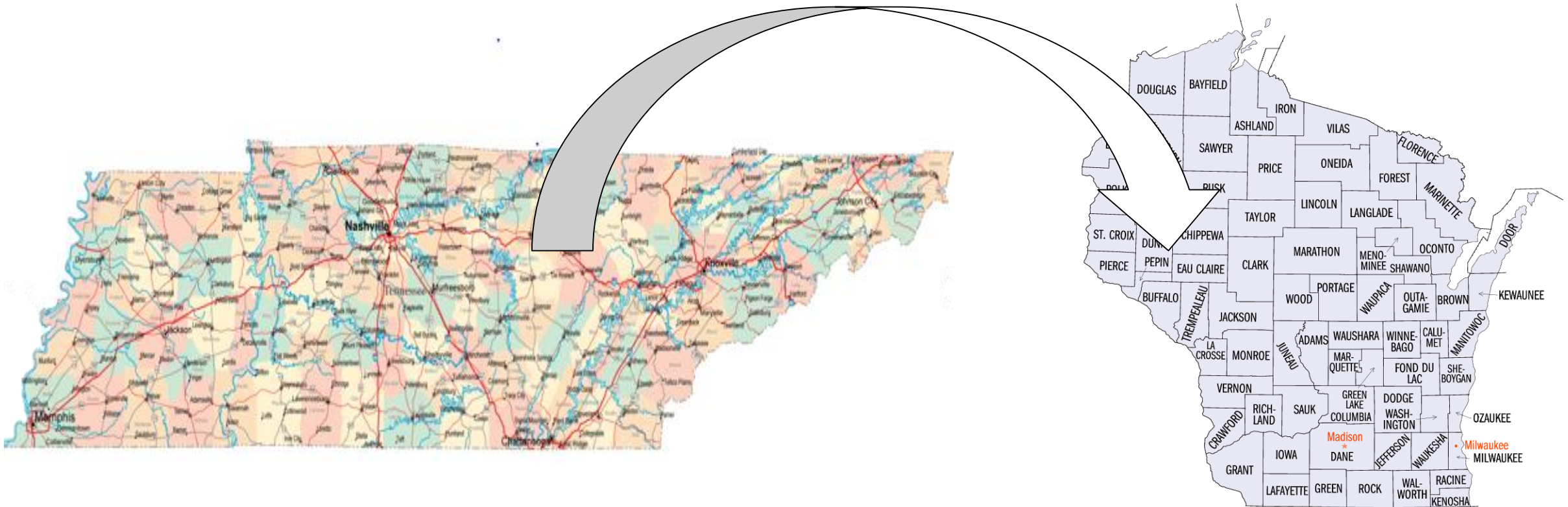


2 Hours per Week



See what others are doing

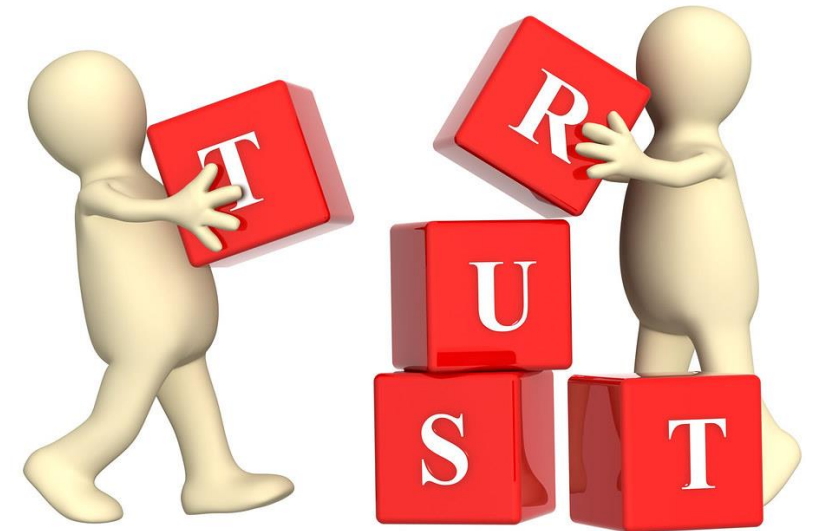
- Visited college in Tennessee
- Adapted their ideas to our program





Focus on building personal relationships with:

- Those being recruited
- Local high school counselors and teachers
- Instructors in the technology department at college
- Managers at local companies



Strategy 1:
Try to recruit
one student
each day



Strategy 2: Share office space with instructors





Strategy 3: **Help students enroll**

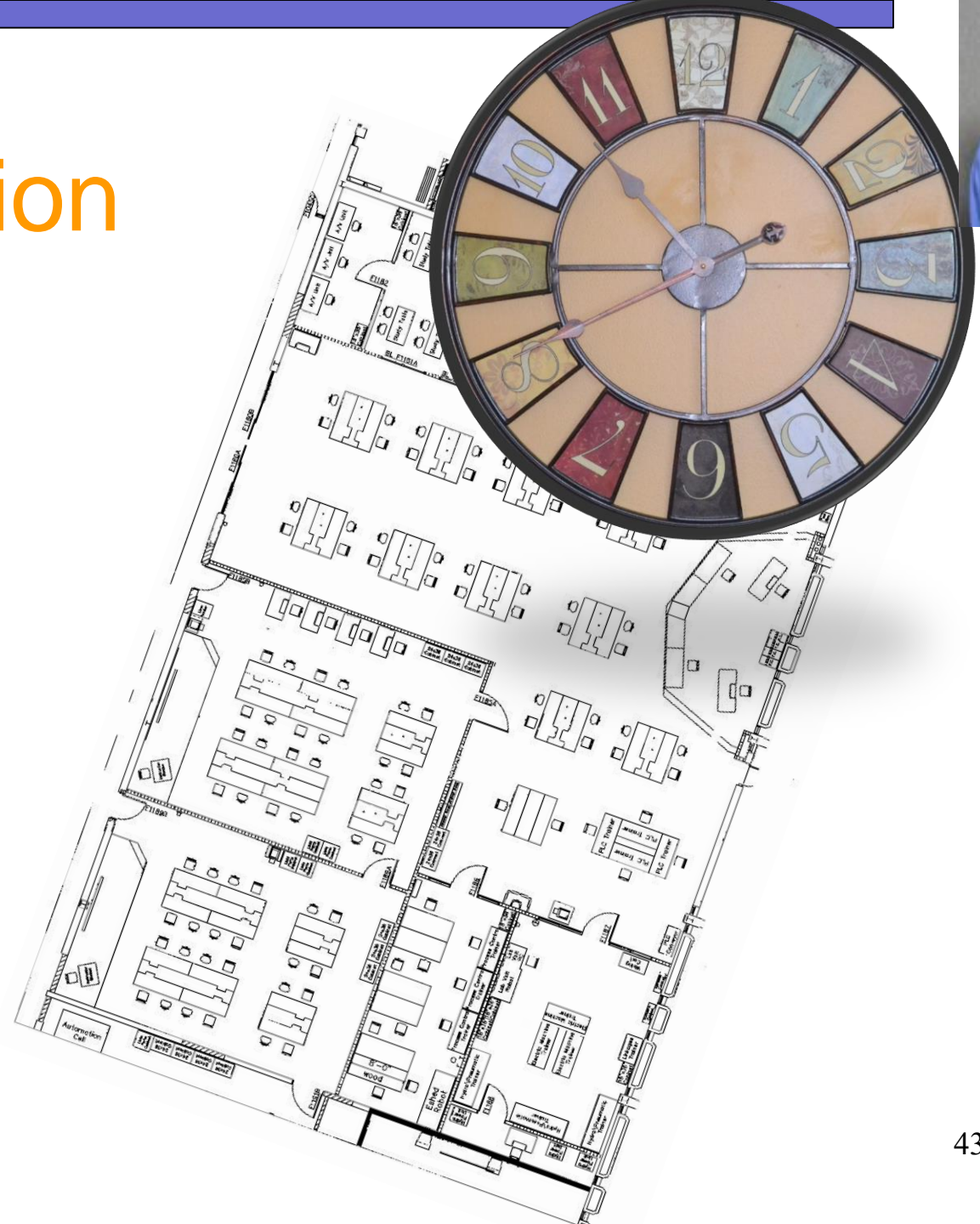


After you RECRUIT you must RETAIN

**Consider Making
Your Program Flexible**

Hours of Operation

- 7:30am to 9:30pm on Monday – Thursday
- 7:30am to 3:30pm on Friday





Instructor Schedules

(3 Instructors)

- Section A** 7:30am to 12:30pm (M-F)
- Section B** 9:30am to 11:30am (M-F)
- 12:30pm to 3:30pm (M-F)
- Section C** 3:30pm to 9:30pm (M-Th)

Critics of Flexible-based Training





Advantage - Flexibility

Accommodates

- **Full-time** students
- **Part-time** students
 - Incumbent workers
 - Swing shift workers
 - Students with families (single parents)



Alternative program structuring
reaches a broader and
more diverse population





- Ideas to get you started
- Many other resources.. .

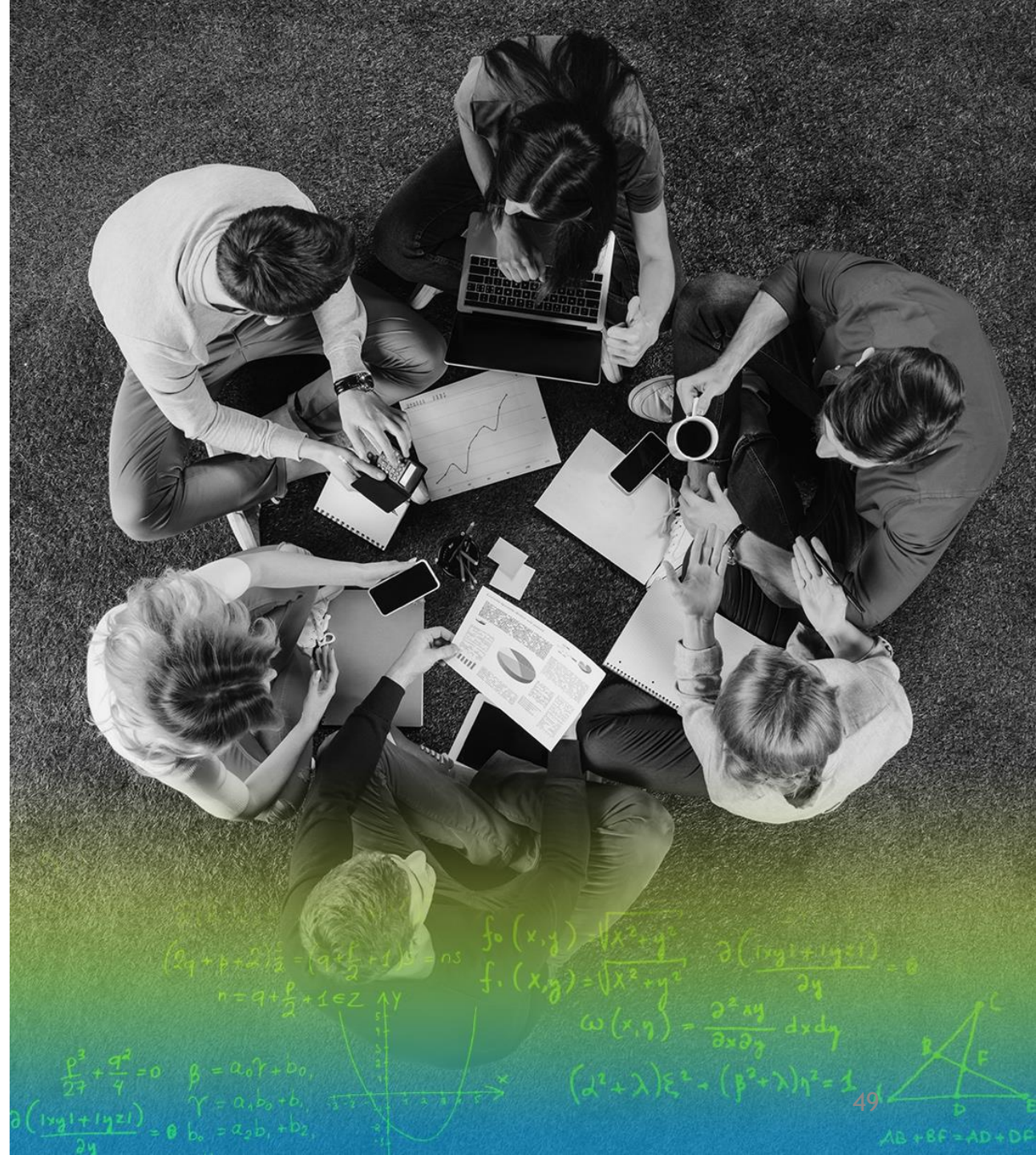


National Center for Women & Information Technology (NCWIT)

Increase the influential and meaningful participation of women and girls

– at the intersections of race/ethnicity, class, age, gender identity, sexual orientation, disability status, and other historically marginalized identities –

in the field of computing, particularly in terms of innovation and development





**MENTOR
CONNECT**

ncwit.org

Academic membership is free!





HSI ATE Hub

- [Mentor-Connect.org](https://mentor-connect.org) > Library > HSI (search word)
- *Culturally Responsive Instruction at HSIs - Strategies that Work* (webinar)
- *Culturally Responsive Technician Education - Asset or Deficit Models* (webinar)
- >38 research papers or other resources specific to Hispanic populations





For Success . . .










- Why you are including diversity? Who do you want to attract/serve and why? Include data. This builds *Rationale*.
- How will you stimulate change? Specify your strategies and activities.
- How will your plan unfold over time and who will be responsible for what? Include budget support.
- What guided your plan? Cite research and/or best practices that you used or will use.
- What experts will you need and how will you include them?
- What target metrics will indicate success?



QUESTIONS





-   www.Mentor-Connect.org
-   843.676.8541
-   mentor-connect@fdtc.edu
-  ATE Mentor Connect
-  @Mentor_Connect
-  [LinkedIn.com/MentorConnect](https://www.linkedin.com/company/MentorConnect)



Webinar Evaluation

- Please complete the evaluation/poll
- Scroll down to make sure you answer all questions





**MENTOR
CONNECT**

Leadership Development and Outreach for ATE

NSF DUE #1840856

Elaine Craft, Principal Investigator

SC ATE Center of Excellence

Florence-Darlington Technical College - Florence, SC 29501-0548



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