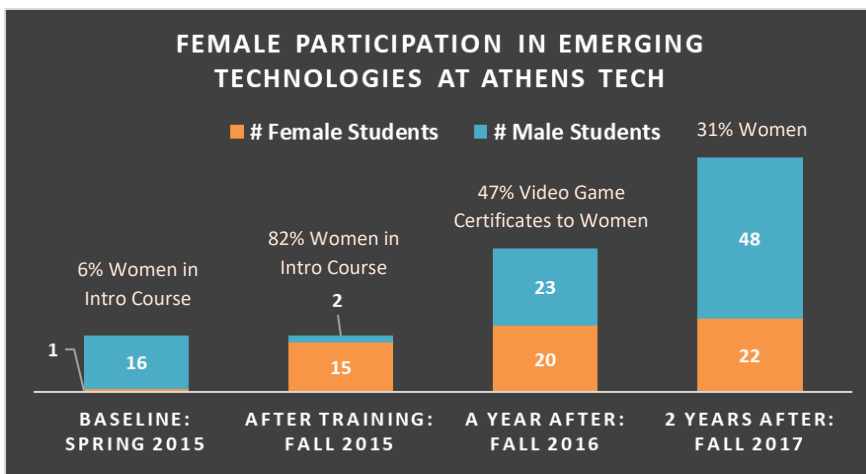# Boosting Female Enrollment in *New* Emerging Technologies Course from 1 to 15 Women in a Semester

How a Program Chair Increased Female Enrollment by 82% with Zero Budget

SUMMARY

Mark Evans, Emerging Technologies Program Chair and Instructor at Athens Technical College (Athens Tech) in Georgia, saw his introductory Emerging Technologies course go from having a single woman to 15 the next semester, after participating in a WomenTech Educators Online Training. A year later, Athens Tech awarded nearly half of their 43 Video Game Design & Development certificates to women. Two years later, the program had grown to 70 students—22 women and 48 men. Retention rates in Emerging Technologies have remained in the 90th percentile from the beginning of program. How did Athens Tech see this kind of success?

FEMALE PARTICIPATION IN EMERGING TECHNOLOGIES AT ATHENS TECH

- # Female Students
- # Male Students

	BASELINE: SPRING 2015	AFTER TRAINING: FALL 2015	A YEAR AFTER: FALL 2016	2 YEARS AFTER: FALL 2017
# Male Students	16	2	23	48
# Female Students	1	15	20	22

6% Women in Intro Course

82% Women in Intro Course

47% Video Game Certificates to Women

31% Women

KEY ACTIVITIES:

- ☑ Recruited female students from other Athens Tech divisions including Nursing with leadership support
- ☑ Drones, Sphero robots, and 3D printers engaged prospective female students
- ☑ Recruitment Campaign with multiple touches: 1) Robot hands-on demonstration; 2) Email campaign; 3) Girls Who Code event; 4) Personal Encouragement Conversation

ATHENS TECHNICAL COLLEGE
Athens, Georgia (Serving Urban & Rural Counties)
Emerging Technologies

RECRUITMENT RESULTS
- ☑ Female enrollment increased from **1 to 15** women in an Emerging Technologies course
- ☑ **47%** of Video Game Design & Development certificates in program awarded to women
- ☑ Program **grew to 70 students**—22 female students and 48 male students (31% female)

"Our college is a numbers-driven organization, **so we know that the strategies we tried after the WomenTech Educators Training really made an impact.**

We now have more women in the program than we thought would be possible. We were able to go from only **1 female student to 15** in an Emerging Technologies course the very next semester after the training. A year later, we awarded **almost half of our 43 Video Game Design & Development certificates to women**. In fact, we're one of the programs that actually got off Perkins' Naughty List for not having enough women represented in the program because we were able to start meeting our goals.

Women are still completely underrepresented in this new economy, and that isn't what I want for my own daughter. This is where it started for me. We have to make a welcoming and safe environment that allows female students to explore new technology and dream big, so that's what I wanted, and I believe that's how it all starts. **It starts with me."**

~ Mark Evans, Program Chair and Instructor, Emerging Technologies, Athens Technical College, GA

CHALLENGES

The new Emerging Technologies program at Athens Tech was the first of its kind as far as Mark knew and no one had heard of it before, so recruiting female students was an uphill battle at the start. The first time Athens Tech offered the Emerging Technologies introductory course only one woman enrolled.

As the father of a daughter, Mark wanted his program to do better. He started looking for "a way to help bridge the gap we have in the South with women and technology" and to get more women into the well-paying, technical positions that needed to be filled in their community.

Athens Tech, like many community colleges, typically focused recruitment efforts on high school students. However, this did not prove effective for recruiting more female students to Emerging Technologies and Mark knew they needed to try something new. He had to persuade his colleagues to go outside the normal recruitment channels and change the department's outreach strategy. They were concerned that recruiting female students already enrolled at Athens Tech was "poaching," so this was a big hurdle to overcome. It would take a new direction to recruit more than one woman per Emerging Technologies course.

ACTIONS THAT MADE THE DIFFERENCE FOR ATHENS TECH

☑ **WomenTech Educators Online Training**
☑ **Developing a Recruitment and Retention Plan**

To change that picture, Mark Evans—the Chair and developer of this new program—brought together a team of key stakeholders from the college for a WomenTech Educators Online Training held by the National Institute for Women in Trades, Technology & Science (IWITTS). His goal was to increase the number of women and develop a "results-driven action plan" that could be implemented immediately with the support of the college's administration.

Mark and his team participated in a semester-long WomenTech Educators Online Training program in the summer of 2015. The biggest takeaway for Mark was "the idea of sitting and just spending time on this issue" and working as a team to think about, "How do we get more women into STEM? How do we get more women into drone operation, into video game design and development? What are some strategies and things we can do?" The training gave the team the time, knowledgebase, and framework to develop a Recruitment Action Plan and campaign designed specifically for Athens Tech and the Emerging Technologies program. According to Mark, the questions their Trainer and Coach—IWITTS's Executive Director, Donna Milgram—asked "made us be very reflective on what we were doing and how we were presenting information."

INSTITUTIONAL SUPPORT: WOMEN IN TECHNOLOGY LEADERSHIP TEAM
Participating in teams ensures that all the key stakeholders are represented and invested. Here are the job titles of the 5 Leadership Team members:

- Key Leader = Mark Evans, Chair and Instructor of Emerging Technologies
- Dean of Technology, Engineering and Manufacturing
- Information Technology Chair
- 2 IT Instructors

Figure 1. Examples of Small Drones for Flying Indoors and Outdoors

RECRUITMENT STRATEGIES

☑ **In-reach to Nursing Students and Other Divisions**
☑ **Hands-on Demonstrations of Spheros and Drones**
☑ **Recruitment Campaign with Multiple Touches**

The Emerging Technologies program started out recruiting students for its new cutting-edge course from its own division, but that wasn't working. According to Mark**, "The biggest change was when I started looking outside of my silo**. I belong to the Technology, Engineering and Manufacturing Division, so I was recruiting there but the students are mostly male. We had to look at the whole college in a very holistic way to change that. **That meant branching off into General Education, Life Sciences, and also the Business divisions. That opened up an entirely new group of people** for me to not only expose to Emerging Technologies, but also to recruit." According to IWITTS's Donna Milgram, "We encourage schools where possible to try recruiting internally from classes and divisions that have a high concentration of female students that may not yet be committed—or admitted—to a career pathway such as Nursing."

Mark liked the idea of recruiting women who were unable to make it into the Nursing program because these women were already at the college, had an interest in STEM, typically scored well academically, and were looking for rewarding careers. Mark successfully gained the full support of the Dean of the Division of Life Sciences & Public Safety by explaining that his new program would close the gap for women in technology, and that recruiting from this audience would retain students at the college that would typically leave after they were unable to get into the Nursing program.

I went to the Life Sciences Dean and said, "*75% of the students that plan to study Nursing do not get selected for the program and drop out of the College. This is a problem and I think we can solve it together***.** Would it be all right if I came over a few days out of the week, and have some drones flying and some Spheros running around, and let people touch and try? He was very receptive to this. He too was very committed to making the college a more inclusive place, and he was concerned we had very good students who were not retained since a GPA of 3.7 or better was needed to get into the Nursing program."

Mark had owned an educational learning company prior to becoming an instructor and met the developer of the BB-8 Droid by Sphero during that time. As an instructor, he started using Spheros to engage female students in technology (see Figures 2, 3, and 4).

Once Mark had the leadership support to recruit women from other divisions, at least twice a month he set up a table with drones and Spheros in a lounge in the Life Sciences building where Nursing students

Figure 2. Sphero Programmable Robots

Figure 3. BB-8 Droid by Sphero

would see them. He encouraged passing female students to stop and play with these examples of emerging technology.

He also put up signs to catch their attention saying, **"The average Emerging Technologist who goes into drone flight makes $74 an hour"** and **"Being a Python Programmer you can start at $37,000 here in Athens. If you go to other places, it's a lot higher."** Mark used this opportunity to get women excited about technology and then used the Personal Encouragement Conversation talking points he'd developed during the WomenTech Training to get women interested in Emerging Technology careers. He also collected their email addresses to send them more information. These email addresses were entered into a database, so he could further engage prospective students with an email campaign (6 emails) that included invitations to recruitment events such as the Hackathon described below.

One of the pieces of technology many female students expressed interest in was the 3D printer. Some of the Life Sciences students were excited to 3D print bones and other students were excited to make art. According to Mark, "I showed them how to use Blender, which is a 3D object making program, and a lot of them said, 'Wow this is really neat, and I've always wanted to do art.' I'd say, 'There's a real need for this especially here in Georgia, because of the movie industry there.' They need 3D modelers a great deal. So that would lead the conversations about different jobs, and career pathways in the Emerging Technologies field."

Campus-Wide Recruitment Events: Said Mark, "We had a Girls Who Code Hackathon; We had events at The Nest, which is a Maker Space that has 3D printers and everything from Little Makey to Google Cardboard.
I encouraged them if they had children to bring them and we would entertain them, so they could try out the technology. When someone was really interested, I set up a time in my office when they could come by and we would chat. "

Both the Girls Who Code Hackathon and the Ladies Night in the Nest were campus-wide events. The Girls Who Code Hackathon was held once a semester as a recruitment strategy. The first Hackathon brought students together to design video games with a Life Sciences angle. **The theme was around infection and how diseases spread, so Nursing students were able to use their Life Science knowledge and translate it into Emerging Technologies.**

So how did Mark know these recruitment strategies worked?

- **22 women showed up for Ladies Night at the Nest** and **8 of them brought their children**. Mark let his 2 female students take the lead with the ladies and he went outside and played with the kids. Mark explained, "I've created this space in the library called 'The Nest'. It's basically a Maker Space but I like the word nest because it feels safe. During "Ladies Night at the Nest," female students came over and really enjoyed doing all the hands-on we had."

"It's called Sphero—a little ball that is programmable that you can use with your smartphone and program with a laptop or an iPad.

It engages students in the technology and it's really cute. The Droid rolls around and does really cool stuff. One of my students made a nutcracker dance for my daughter. **As an instructor it allows me to get into coding in a way that is non-threatening.** Sometimes when you sit down in front of a screen and you've got 40,000 lines of code it just really blows your mind. With Sphero, it's very easy and it's chunked in a way where it makes sense. It's pretty cool.

I think I had a lot more fun than the students to be honest with you, because there's a real joy in teaching someone to drive a Sphero for the first time, or navigate an obstacle course, or to go outside and fly a drone."

~ *Mark Evans, Program Chair, Emerging Technologies, Athens Technical College, GA*

Figure 4. Programming Sphero by iPhone

- Mark recruited one of his female students from his church. She told him she wasn't good at technology and he used a Personal Encouragement Conversation to convince her to give the Emerging Technologies course a shot for one semester. She turned out to be one of his best students and he offered her the position of the manager of The Nest.

- **7 of the 15** females enrolled in the 2nd cohort of Emerging Technologies came from the original e-list of 55 female students in the hallway in the Life Sciences division.

Mark's budget for these recruitment activities? Zero.

According to Donna Milgram, "Multiple touches is what works in outreach these days and Mark's recruitment campaign is a good example of this. Talking in the hallway might pique the interest of some female students, then having them attend a Code Like a Girl Day and Ladies Night at the Nest gives them additional exposure and information and the opportunity to see that there will be other female students in the course. The days of sending one email or posting one flyer are long gone."

ADVICE FOR OTHER EDUCATORS: GET TECHNOLOGY INTO THE HANDS OF PROSPECTIVE STUDENTS

Mark's biggest piece of advice for other educators working to increase diversity in technology programs is to get in front of your target audience for recruitment and put fun examples of technology right into their hands so they can touch it, try it out, and get excited about the possibilities. He's noticed that underrepresented students often don't have ample access to technology, so, for him, it starts with access and personal encouragement. He also recommends talking with key stakeholders and college leadership to build the institutional support needed to implement a college-wide recruitment plan. Finally, here are some other recruitment tips from Mark:

☑ **Build relationships with female role models that graduate from your program, share their stories with prospective female students, and connect them with current students:** "I think the one I'm most proud of right now is a young woman by the name of Mary. She came from the business side though, she didn't come from Life Sciences, but she really got into Augmented Reality (AR) and has started her own AR business here in Athens and is now hiring my students to work for her."

☑ **Hold open courses where prospective students can come by, try out technology, meet other students, and talk with the instructor:** "My classroom is completely open and, well, the other day, I had a student who brought her niece in."

☑ **Train counselors and career advisors to recruit women to technology programs and careers:** Mark and his team provided an hour of professional development to counselors at Athens Tech on how to recruit women to technology.

"I think the Hackathon was a big eye-opener for a lot of the women who enrolled that next semester; they didn't feel like they had wasted their time.

They weren't abandoning what they liked about the Life Sciences. They were just going about what they wanted to do in a different way. So that was a really cool couple of days. To me, I think that was a linchpin for most of them, is that they were looking at what they were doing. By that time, some of them had figured out that they weren't going to make the cut. They were looking at well what's a good "plan B", and the Hackathon really played towards their strengths, they were able to see Emerging Tech as something that they would like to do.

I had a sheet of paper with a sign-in list which I transcribed into a spreadsheet and I immediately sent everybody an email thanking them for their interest and pointing them to our activities and letting them know that I would be sending them follow up emails about a couple of other events."

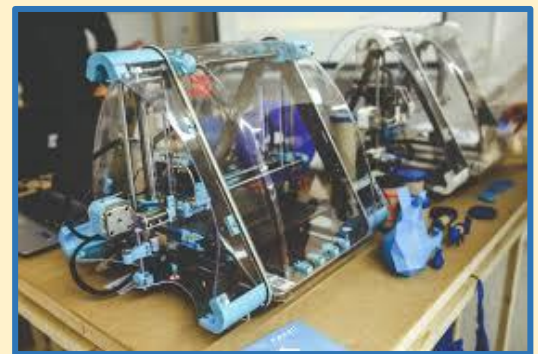*~ Mark Evans, Program Chair, Emerging Technologies, Athens Technical College, GA*

Figure 5. Examples of 3D Printers

RETENTION

☑ **Welcoming Talking Points First Day of Class**
☑ **Final Project Helping Others**

Mark's Emerging Technologies introductory course had a **100% retention rate**. Here are some of Mark's strategies to retain his students:

First Day of Class: "The first day of class I give them my pitch on why they need to be in this class. This class is for you to get your hands dirty for the first time and to really look at things and find the joy of technology. There is a joy there and we just have to figure out what your joy is. I'm looking for competency not mastery. Some of you are really going to excel at 3D modeling and 3D printing. Some of you are going to excel in drone flight and in drone repair. Some of you are going to excel with big data and creating info graphics. All of you have a gift in technology, we just have to figure out which one it is. And so, there's going to be times where you're going to get some things right away and then there's going to be other times where you're going to struggle and that's okay. "

"We've got to get people with their hands on this stuff, and to close the digital divide.

A lot of times, people just don't have access to this type of technology, and so by giving them even just a taste of it, makes them want more. If we can get that drive for them to want more, they'll enroll. So, my big suggestion would be just to get out there, go and talk to your colleagues, be open to your students, and just get them to try the technology."

~ Mark Evans, Program Chair, Emerging Technologies, Athens Technical College, GA

Final Project: Mark learned in the WomenTech Training that helping others with technology is important to the majority of female students, so he picked projects that took this into account. In Mark's own words, "One of the final projects for the spring is a hospital mission in Guinea that needs a low power internet solution. I thought since a lot of these folks come from the medical side that they might be able to help with that, but there are also a myriad of problems with this hospital. They got decimated by the Ebola outbreak. They were one of the few hospitals that didn't close, they stayed, and because of that they're lacking resources. So, they need an internet presence and have many other technology needs."

ABOUT IWITTS: CREATOR OF WOMENTECH EDUCATORS TRAINING SYSTEM

The Institute for Women in Trades, Technology & Science has been helping educators nationwide close the gender gap for women and girls in technology since 1994. IWITTS provides tools, resources, and professional development for educators to help them broaden female participation in STEM and CTE programs where they are underrepresented.

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