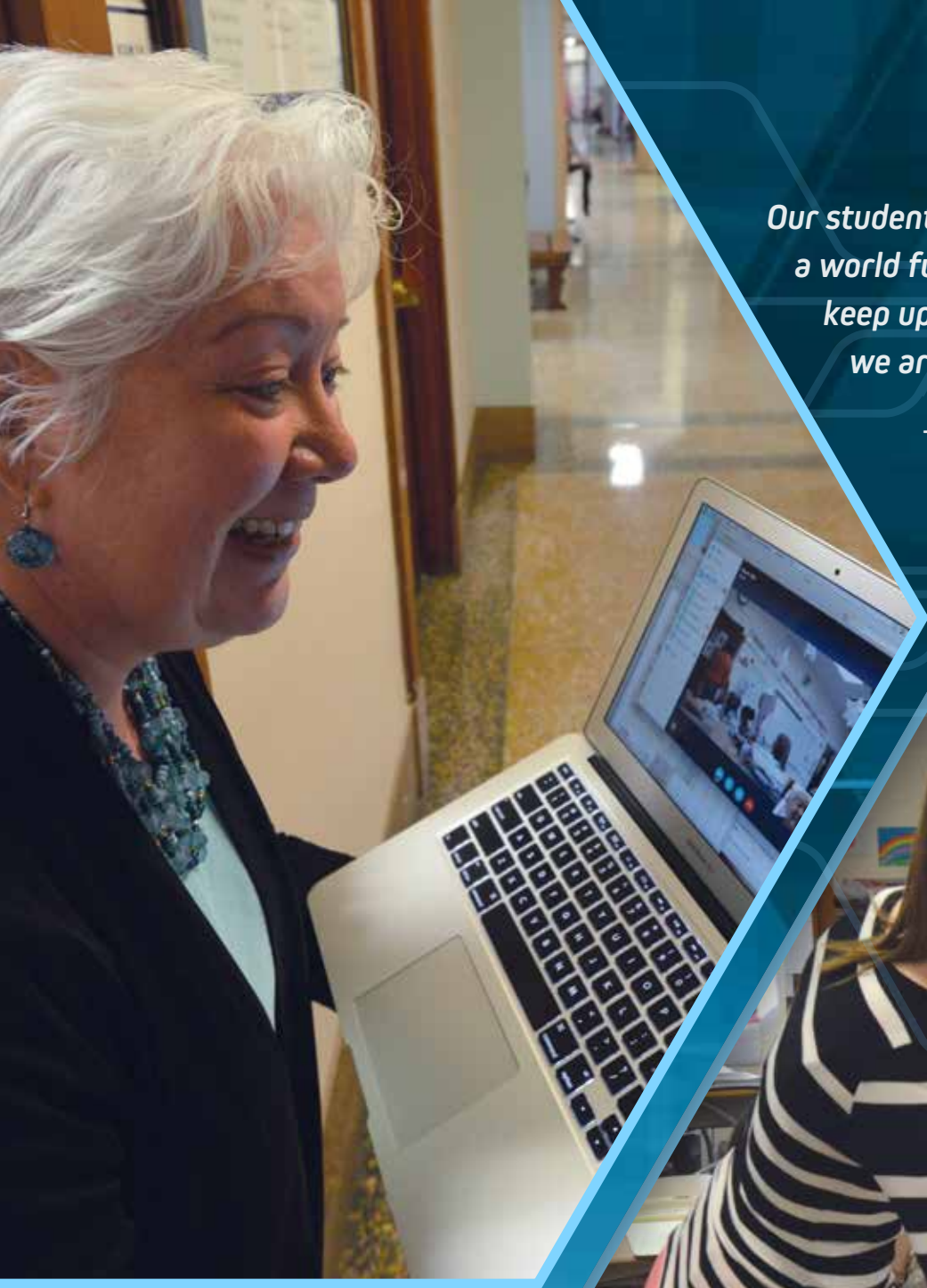

Our students here are going out into a world full of technology. If we can't keep up here in preparing them, we are doing them a disservice."

- **Marìa Almendàrez Barron, Ed.D.**
Assistant Professor of Education





TEACHING *WITH* TECHNOLOGY

From virtual coaching and patient mannequins, to online learning and mobile applications, the power of technology is alive and growing at La Roche College. Professors are implementing and even inventing new technologies to match or improve the quality of traditional learning. | PHOTOS: JIM JUDKIS

EDUCATION

The white glow of a SMART Board shines across Hannah Bevington's face as she stands in front of a room full of second-grade students on an early Thursday morning.

As she presents her lesson on possessive nouns, Ms. Bevington, a junior majoring in PreK-4 and Special Education at La Roche, hears a familiar voice: "Great example," the voice says. "Good job."

The discreet, affirming voice belongs to Assistant Professor of Education Marìa Almendàrez Barron, Ed.D., who uses Skype and a Bluetooth earpiece to coach Ms. Bevington from a remote location.

For the past three years, Professor Barron has used bug-in-ear technology to e-coach her students as they stand in front of real, live classrooms for the first time during their Teaching Reading and Language Arts Practicum course.

Bug-in-ear technology was brought to the forefront of education by Dr. Marcia Rock, a seasoned researcher and educator at the University of North Carolina. Dr. Rock observed that virtual coaching, compared to traditional coaching, offers a time-efficient and cost-effective method to help students improve their lessons as they happen. While bug-in-ear is not a new technology, webcams, Skype, laptops and Bluetooth headsets have changed the way instructors such as Professor Barron utilize it.

"This type of coaching helps students to be reassured when they are doing good things, and it helps them to get immediate correction," Professor Barron explained. "The most difficult thing with any kind of instruction is if you have to wait until after something has been done to explain what was wrong. When you use bug-in-ear, you prevent bad habits from being started."

At La Roche, this technology doesn't replace human interaction; instead it serves as an advantage to students and instructors when face-to-face communication is not possible. The classrooms used for practicum are equipped with a webcam, and the student wears a Bluetooth earpiece so that Professor Barron can give immediate feedback as she watches lessons unfold from her computer screen.

"Our students here are going out into a world full of technology," Professor Barron said. "If we can't keep up here in preparing them, we are doing them a disservice."

CYBER SECURITY

As security breaches and sophisticated cyber attacks continue to frequent today's headlines, it's no secret that cyber crime is a very real and growing threat to people, businesses, governments and organizations.

With the Bureau of Labor Statistics projecting a growth of 37 percent in the employment of information security analysts from 2012 to 2022, there is a high demand for professionals who not only know how to solve cyber crimes, but also prevent them.

At La Roche, the Computer Security and Forensics minor brings together the disciplines of technology and criminal justice to prepare this new type of professional to protect a company's personal data.

In the Computer Forensics Investigations course led by Adjunct Professor Michael Overholt, a retired Pittsburgh Police Cyber Crime Task Force investigator, students apply computer security techniques to the physical evidence of a crime.

"My main focus is twofold. One is for law students and criminal justice students

to understand how the law developed, evolved and now works, and how the Internet itself created opportunities for crime," Professor Overholt said. "The other side focuses on internal crimes, and how you can help IT departments and corporations that use these big networks and the Internet be aware of the threats that are out there."

Students analyze crime scenarios through AccessData, a leading provider of Computer Forensics and Cyber Security software. AccessData includes Forensic ToolKIT (FTK), which collects data inputted by users of Windows machines and indexes information for examiners.

Using the FTK, students can view a forensic collection of information and data from the registry of Windows computers to identify the machine's owner, when the operating system was originally loaded, the last time it was logged onto and the last device that was plugged into it.

"You should understand how that technology is working, what you are doing when you're clicking away on those keyboards, and why certain rules and regulations are out there."

- Michael Overholt
Adjunct Professor,
Computer Forensics Investigations

The class also uses a technique called Dictionary Attacked on encrypted files, and students attack encryptions based on information that the user has entered into the computer system.

"Students learn where data is kept and how it's stored. Most people come in here and have a good grasp of how a computer works, but all of this gives you the bigger picture," Professor Overholt stated. "This information gets students set and ready to go in the real world with the idea that we can be proactive against these threats and that we don't have to wait for them to happen.

"There isn't a field out there right now that doesn't use technology," he continued. "You should understand how that technology is working, what you are doing when you're clicking away on those keyboards, and why certain rules and regulations are out there."



Nicole Jones, SRNA practices her clinical skills in the Medical Simulator Lab as Program Director Deborah Davison CRNA, M.S. and her assistant, Melody Vetica DNP, CRNA, control the medical mannequin.

NURSE ANESTHESIA

It happens with the click of a computer mouse in Room 205 of the Palumbo Science Center: A patient has an adverse reaction to surgery. His heart rate rises, his steady breathing turns to a slow wheeze.

Above him stands a student nurse anesthetist, who must analyze the situation and react appropriately before it's too late. In the operating room, there's no time to think. But in La Roche's Medical Simulator Lab, with its lifelike patient mannequin, there's time to learn.

Students are introduced to the lab in the first year of the two-year Master of Science in Health Science (Nurse Anesthesia) graduate program offered through a partnership between La Roche and Allegheny School of Anesthesia.

Associate Vice President for Academic Affairs and Dean of Graduate Studies & Adult Education Rosemary McCarthy, Ph.D., said, "What the Simulator Lab does is augment the actual experiences that students will come upon in real life and assist them to handle rare occurrences in the OR."

The lab includes all of the technology found in a typical operating room: an advanced monitoring system, a gas delivery system and technology that supports surgical and resuscitative care. The instructor controls the patient mannequin – which has the ability to talk and breathe – and can even manipulate the patient's blood pressure and heart rate.

"As the instructor makes changes to the mannequin, the students respond in a way that they're supposed to. If the student is having trouble or doesn't know what to do, the instructor is right there," Dr. McCarthy explained. "It's a dialogue that goes back and forth between the instructor and student. There is constant feedback. The instructor can certainly see whether the student is struggling or knows what to do."



"The main goal is to promote patient safety. This allows students to make critical decisions in a safe environment where there will not be any adverse reactions to a real patient."

- Rosemary McCarthy, Ph.D.
Associate Vice President for Academic Affairs and Dean of Graduate Studies & Adult Education

This technology makes it possible for students to apply their clinical skills before they even step foot into a real operating room. With a mannequin that is very much like a living, breathing person, the Medical Simulator Lab introduces students to rare, but very real, occurrences in today's hospitals.

"The main goal is to promote patient safety," Dr. McCarthy added. "This allows students to make critical decisions in a safe environment where there will not be any adverse reactions to a real patient."

CHEMISTRY

Chemistry students at La Roche can now forget about scribbling notes or relying on memory to study or learn classroom material.

This year the Chemistry Department will incorporate Tegrity, an arm of McGraw-Hill Higher Education and a leader in lecture capture technology, to provide video recording and cloud-based storage facilities.

Room 103 of the Palumbo Science Center will be outfitted with a ceiling mounted camera and software which will enable General Chemistry and Organic Chemistry lectures to be video-recorded, and fully synchronized with Microsoft PowerPoint, white-board notations and word-processed handouts.

This new technology will allow chemistry students to replay content-heavy lectures as often as they like, and download lectures from Blackboard onto their laptops or Smartphones.

Students also will be able to search for any word or phrase presented during lectures, and Tegrity will instantly jump to that portion of the lecture that discusses the topic.

"Students can re-listen to a lecture as many times as necessary to master every concept that is discussed," Chemistry Department Chair Don Fujito, Ph.D., said. "A concept, such as nucleophilic substitution, is discussed several times during the year, then Tegrity will enable students to jump to the exact instance in a particular lecture where this concept is discussed, and will enable students to jump to the next instance two lectures later where it is brought up again.

"The Chemistry Department will be monitoring the usage regularly and testing to see if this technology improves mastery of each student's learning," he added.

The Tegrity system, which will cost $8,000 during this pilot year of operation, is funded entirely by Chemistry Department grants.

Students and professors hone in on app development, 3-D printing, social media and more.

Senior **Toni Burley** was a first-place winner at the 2014 Smart Tag App Hackathon powered by AT&T.



Produced by the AT&T Developer Program, the Smart Tag App Hackathon challenged participants to collaborate and put their development skills to the test by designing and creating a mobile app. The competition was held at the University of Pittsburgh and was open to student developers from surrounding colleges and universities.

Students competed for prizes across several categories, and Ms. Burley placed first in the Best Use of IBM Technologies from a Student Team, receiving $1,000. Other categories included Best Overall Mobile App, Best Smart Tags App, Best App From a Student Team, Best App Using IBM Technologies and Best Use of an AT&T API.

"The biggest challenge of the Hackathon was forming a diverse group that could commit to the challenge at hand," Ms. Burley said. "My current high-level courses at La Roche College prepared me to work in a group dynamic and use other resources to find valid answers to problems."



Peter Biernesser, a junior, was the recipient of a $1,000 scholarship from the Association of Information Technology Professionals (AITP).

This year AITP's essay competition challenged students to discuss the future of 3-D printing, but Mr. Biernesser did not have to look far for inspiration for his award-winning submission.

"Ironically, after hearing about this challenge, a featured video on YouTube was of a boy, who unfortunately only had one arm, receiving a new, fully-functioning, 3-D printed prosthetic arm," he explained. "After seeing that video, I knew there couldn't be any better future use of 3-D printing than helping the disabled overcome their impairments."

Mr. Biernesser is double majoring in management information systems and business management, with a minor in information technology (IT).

"IT is not just a field, but a cross-functional operation that is integral in almost every type of business," Mr. Biernesser said. "I like having to come up with new and innovative ways to resolve problems, possibly before they even arise. IT can be a challenge at times, but that is what I like most about it. I like the challenge."



Jane Arnold, chair of Computer Science and the Natural & Behavioral Sciences Division, focused on programming mobile applications during her recent sabbatical.

Professor Arnold studied Android programming and also enrolled in a Standford course, CS193p Developing iOS 8 Apps with Swift, on iTunesU. Swift is the new programming language designed by Apple to replace Objective-C for iOS development.

"My sabbatical is extremely well-timed as it allows me the time I need to master the new skills as huge changes are happening in the mobile app industry," she said. "I am excited to share these new skills with my computer science students when I return in the fall."

Aside from sharing these new skills, Professor Arnold also will apply them to create her first real-life app for Android and Apple devices: an attendance tracker for the La Roche Experience program.

Her idea is to create an app that enables instructors to scan a student's La Roche ID card as they enter a workshop. Professor Arnold said she hopes to beta-test this app in fall 2015.

"If it's a success, I believe it can be generalized for any activity that wants to record attendance: student-life events, community service or even regular class meetings," she said.

"My sabbatical is extremely well-timed as it allows me the time I need to master the new skills as huge changes are happening in the mobile app industry."

- Jane Arnold
Chair of Computer Science and the Natural & Behavioral Sciences Division

When she returns from sabbatical, Professor Arnold said she also hopes to design new upper-level computer science elective courses in Android and iOS development.



Kaylee Zozos received departmental honors in Communications, Media and Technology for her thesis, "Rebelling Women: Developing a Brand Identity for the PA Rebellion and Women's Professional Softball."

Ms. Zozos focused on the PA Rebellion, a women's professional fast-pitch softball team in Washington, Pa. that joined the National Pro Fast-Pitch League in 2014.

The project was to create a marketing plan aimed at developing relationships between the organization, its players and the community. Ms. Zozos' main focus was multiple social media platforms and promotions to engage the organization's audience. The marketing plan offered a revised and enhanced brand identity designed to express the values of the PA Rebellion to new and existing fans.

Q&A

La Roche College professors do more than lead the classroom – they develop the tools to improve it.

Take for instance, **Jeff Ritter, Ph.D.**, department chair of Communications, Media and Technology.

Dr. Ritter recently developed TeachBack, an easy-to-use mobile application for teachers, professors and administrators across all disciplines. This new educational tool gathers student feedback through premade and custom-designed surveys, and allows instructors to view results in real-time.

Dr. Ritter released TeachBack under Relative Content, a company he founded to develop educational tools to empower teachers and students to achieve the best education possible.

What inspired you to develop this product?

I always wonder how students perceive a class, especially an active learning class that I put a lot of time into preparing. I figure there are other teachers and professors like me around the world, and the feedback would be helpful.

In one of my classes a few years ago, we looked at a new company that was getting instant feedback for services in different types of businesses. The class agreed that something like this, but for teaching, would be great.

How long did it take you to develop the application, and what are some of the challenges and rewards of creating a new educational tool?

Development took about a year and a half, and I worked with a programmer, a designer and a public relations company in managing the project.



Deadlines are the biggest challenge. With everyone working on multiple projects, it was hard to meet deadlines.

The rewards are incredible. It is incredible to hear great feedback on the product, to have something on the iTunes app store and Google Play, to see the website hits and to track downloads around the world.

What are the benefits of students and educators using TeachBack?

Teachers can get feedback on a class right after it happens, which is different than waiting until the end of the semester to see the class evaluations. You can always give out a poll in a class, but unless it is anonymous, you really can't expect honest responses. Through TeachBack, students get to feel like their opinions matter.

Education has become so difficult today, mostly because getting a student to feel engaged with the material in the class is so hard – due to both the distractions available and a general resistance that many students have. TeachBack can make students feel like the teacher really wants to know what gets through to them and grabs their attention.

What are some of the best features of TeachBack?

I think the best feature is that the poll is so quick and easy for the student to complete. A touch screen is the gold standard for quick feedback today, and I am thrilled that it is there.

The other great feature is the effect I have already seen and been told about: Students like being asked for their opinions. It brings a good feeling to the students, or to anybody, to know their opinions are important.

How does student feedback improve lectures and enhance the classroom experience for students?

It gives teachers the chance to find out more about the students' perceptions of what is going on in the classroom such as: Do they perceive the instructor as enthusiastic? Do they perceive other students as engaged in the material? Do they think the facilities are adequate?

I hope TeachBack leads many teachers to make their classrooms more interactive and active instead of just lectures.

How does this product improve a professor's effectiveness in ways that traditional methods can't?

You can always ask your students, "How was that?" If you know them well and already have a good relationship with them, you'll get a reliable answer. But I am sure that a huge majority of professors, trainers or teachers around the world don't have that level of comfort and trust with some of their students. So, I think this will be good for them. TeachBack also would be beneficial to new teachers and graduate assistants.

Of course, you don't want any professional to get too dependent on direct feedback. Learning to read the room, and gauge student attention and interest, are important skills to develop for anyone in front of students. But technology should be there to assist in that process.

What are the challenges and opportunities of using technology as a teaching tool?

The potential of going too far to entertain or keep students' attention can obfuscate the reality of high-level and college-level learning. It is challenging, and it demands focus and attention, and it isn't easy or even possible for everybody.

But the reality we face is that many people need help in keeping focused on anything today. An instructor or professor can try to help make that process work, or they just can complain about it. Maybe Teachback can help some instructors make the leap they haven't made before.

What do you enjoy about implementing new technology in the classroom?

It is a challenge to find the best ways to use technology without just throwing it at the problem. But using the best features of technology can enhance empowerment, active learning and attention in the classroom.

Are you working on additional features or enhancements? What are your plans for the future of TeachBack?

If it continues to grow, and people use it in English, Spanish and Chinese around the world, I am thinking of developing it as a generic polling app for use by any organization looking for instant or anytime feedback from a subscriber. The application might be good for any media company, cultural organization or even different kinds of research. I may start charging for it by then too! But right now it is free.

TeachBack is available to download for free on the iTunes App store and Google Play Store. Available in English, Spanish and Chinese, the application works seamlessly across iOS and Android devices. Educators in any field may use the tool as long as their students have smartphones or iPads. Visit ***teachbackapp.com*** *to learn more.*