



Biology/Allied Health Department

## Online Science Classes: The Next Advance in Education or a Race to the Bottom?

The Internet has changed the way we do business, shop, and communicate with family and friends. It has also changed the face of education. No longer are students confined to a classroom and experiencing lectures from a single professor. Instead, college students are able to surf the internet for information and get opinions from multiple individuals about a single topic.

However, educational changes are not limited to research papers or English essays. With the introduction of online classes, students have been able to take a variety of courses from the comfort of their homes. The changes in educational landscapes have been as dramatic as changes to business, banking, and industry.

The first online class was offered in 1994 and was an outgrowth of distance learning classes in which the professors used recorded lectures for video or TV viewing<sup>2</sup>. By 1999, 61 percent of colleges and universities had plans for online distance learning<sup>1</sup>. Distance learning became the catchphrase in educational circles, and universities scrambled to implement online distance learning classes.

Never before have students had such a wide variety of courses being offered at a click of a mouse. Khan Academy, created in 2006, advertises on their website: "You only have to know one thing: You can learn anything. For free. For everyone. Forever." In Khan's listings, you can find offerings for chemistry, math, physics, and biology and was designed by Salman Khan

to provide free education for everyone. In 2012, massive online open courses (MOOCs) listed free online classes from top universities.

With the hundreds of courses listed on the web from top universities, one would think that the traditional classroom lecture is as doomed as the dodo bird. However, of the thousands, and in some cases hundreds of thousands, of students registering for MOOC classes, over 90 percent of those students do not finish<sup>4</sup>. These students are finding that time management is a big hurdle to finishing their free education and are often unable to find time to read the assigned textbook and supplemental material.

Online learning has also opened the door to enterprising entrepreneurs who have developed a business of taking online classes for students for a fee, and promising a grade of B or better. Companies such as "No Need for Study" offered a tutor for an online English Literature class from Columbia University for a fee of \$1,225.15<sup>3</sup>. This takes cheating to a whole new level and compromises the integrity of online learning for everyone. After all, one of the goals of education is to equip the student with knowledge that translates into an income-producing career. However, that B or better grade, earned by a paid tutor, is only as good as the paper upon which it is typed for the student applying to a position after graduation.

Some fundamental questions need to be asked.

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Biology/Allied Health  
Department  
P.O. Box 370  
Collegedale, TN 37315  
Phone: 423.236.2926  
Fax: 423.236.1926  
southern.edu/biology

Joyce Azevedo, PhD  
Randy Bishop, MSPT  
Aaron Corbit, PhD  
Ann Foster, PhD  
Lucinda Hill, MD  
Valerie Lee, MS  
David Nelsen, PhD  
Rick Norskov, MD  
Lee Spencer, PhD  
Keith Snyder, PhD  
Debbie Strack, Office Mgr.  
Ben Thornton, PhD  
Tim Trott, PhD

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Is an online science class completely equal to a traditional science class complete with laboratory experiences? Omitting students who would cheat or fail to complete the online course work, does the online student gain an equal education to one who completes the same course in the classroom? Universalclass.com offers Microbiology 101 for \$85 with no certificate or \$110 with continuing educational units (CEU) certificate, and it covers 3.0 CEUs in 29 lessons and 52 exams and assignments. University of New England (UNE) offers a BIOL 1020: Microbiology course online and makes available a lab component for an additional hour. The lab is a software simulation package, VirtualUnknown™ Microbiology. UNE's description for this class and lab experience states: "The laboratories for this course are much the same as laboratories accomplished on any college campus, except that students work alone at a distance from campus. The laboratories are at a level used for microbiology majors and pre-health majors at challenging institutions." For

UNE's Medical General Chemistry I lab, "the experiments performed by online students will take place in their homes using LabPaq™ purchased through Hands-on-Labs, Inc. This company provides lab kits that provide an experience similar to ones found in a traditional campus science lab.

There is no doubt in my mind that the software providing the virtual microbiology laboratory experience is well designed and implemented, or that the LabPaq™ purchased by the online chemistry student, provides the reagents and test tubes needed for a specific chemistry exercise. However, in both of these disciplines, there are "hands-on" components that cannot be replicated. In microbiology, physically learning how to streak bacterial cultures for isolation on a petri plate, or using aseptic techniques, cannot be replicated by clicking a mouse and dragging an icon to another location on a screen. For chemistry students, does their chemistry lab pack also provide an analytical balance? Do they learn how to weigh microgram quantities of a

reagent? Are companies willing to hire a new graduate whose science education has been provided by virtual reality, even though the company will need to train the new graduate in lab skills needed for the job? Time will tell whether we are opening a new exciting avenue in higher education science classes, or if we are providing a fast track to the bottom for those students opting to take their science classes online.

*By Ann Foster*

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## Undergraduate Research

### Human Anatomy and Physiology Conference

My first Human Anatomy & Physiology Society (HAPS) conference was last year in San Antonio, and I had a great time meeting new people and learning about teaching anatomy. When I realized the 2016 conference was going to be in Atlanta, only two hours from Southern Adventist University, I knew I had to try to bring some students with me. Due to the generosity of the Biology/Allied Health Department and our donors, I was able to take four undergraduate students with me to the conference in May. Three other professors from the department also attended. To qualify for a spot, each student submitted a proposal for a poster session. All four poster proposals were accepted, and three of the students presented during one of the poster sessions. One student wasn't able to present because her research

was also accepted at a more prestigious conference that didn't allow her to present the research ahead of time. I asked each undergraduate to write a paragraph about her experience and would like to share these paragraphs with the friends and alumni of the department.

*By Valerie Lee, Assistant Professor*

Going to the HAPS conference, I felt like an outsider of sorts. I had just graduated with a degree in biology and am currently in veterinary school. I knew that HAPS was a little out of my comfort zone, but I also want to earn a master's degree in public health so I tried to be open-minded. I was unprepared, however, for just how much crossover I would experience. The seminar on animal limb movement was especially applicable to a student like me. Seeing again how much animals can be

used to benefit humans, and indeed the other way around, was very beneficial. Additionally, the seminar on zoonotic disease seemed to be presented just for me. Improving the way animals are managed can benefit not only the animals themselves but the people who are interacting with them. After attending workshops across many disciplines, my horizons broadened once again. Specifically, the workshop on correct pronunciation was just as useful for me as for my human anatomy and physiology counterparts. I might have gone to the HAPS conference feeling like an outsider, but I left feeling like part of the family.

*By Molly Theus, BA Biology, 2016*

I am so grateful for being able to attend the HAPS conference with some of the Biology/Allied Health faculty at Southern



this year. This was one of the best experiences I have had in my college career. Not only was I able to see how professional research is presented, but I was also able to learn so much about the amazing human body. I was so fascinated by all of the incredible research that is going on, especially with the American Cancer Society, and the opportunity to learn—even about terms that I’ve been pronouncing wrong since I was a freshman! This conference helped solidify my interest in the human body, and I was very impressed with the organization and learning opportunities. I would recommend going to anyone and am definitely considering attending again in the future.

*By Emily Scriven, BS Health Science, 2016*

Attending the HAPS conference was the best opportunity I have had thus far in my college career. I’m currently a level III nursing student who has been involved with the Biology/Allied Health Department at Southern since my freshman year. I was invited to go on this trip and was able to present research on a program called Peer-Assisted Study Sessions, which was developed in 2009 and is used at Southern. I was able to share my research with professors from several universities, and many professors were interested in using this program at their own schools. I felt very fortunate that my topic interested so many people. Toward the end of the conference, workshops were held at

Georgia Institute of Technology. These workshops were definitely the highlight of the conference! I learned about anatomy and physiology in the Italian Renaissance, proper pronunciation of medical terms, and an extensive history of pituitary gigantism. But most importantly, during the conference, I was able to connect with my university professors. We grew together in knowledge and friendship, and that is truly irreplaceable.

*By Nicole Sacdalan, BS Nursing, 2018*



Molly Theus, Emily Scriven, Nicole Sacdalan, and Elizabeth Paiva

I recently graduated from Southern with a bachelor’s degree in nursing. I want to thank the Biology/Allied Health Department at Southern for sponsoring me and allowing me to experience HAPS 2016. To be completely honest, my nerves were all over the place before I had to present the research poster my team and I had prepared. I was scared that someone was going to nitpick and criticize me, but the opposite happened. No one criticized me but rather asked questions that could help further future research. The poster session

experience was definitely a confidence booster, proving that people genuinely want to help others and not bring them down. I also really enjoyed learning amazing teaching strategies that I can implement when I teach in the future.

I attended a workshop that combined the history of art and anatomy. Combining hobbies that students enjoy, with anatomy in the classroom setting, can help students who are visual learners and make art more appealing. Another workshop I attended focused on helping students learn how to study. The success of any class is learning how to dissect a book, look at its key points, and talk about those key points. In addition to pursuing a career in nursing, I hope to one day be a professor of human anatomy. I can’t wait to integrate these strategies into the classroom setting one day. Had I not attended this conference, I would have never thought to incorporate these strategies! I now have knowledge that will one day help my future students.

Our bodies are so intricately put together that I can only believe that God truly is the artist that put us together. Through teaching, I not only want to show students the complexity of our bodies for their future careers but to also share with them the love that our Creator took when putting us together.

*By Elizabeth Paiva, BS Nursing, 2016*

## Biology/Allied Health Department ‘Happenings’

The Ecology class has recently gone on several field trips, including one to a special “off-the-beaten-path” tour of Mammoth cave in Kentucky.

On his Sabbatical, Professor Keith Snyder has been working with Southwestern Adventist University’s Professor Art Chadwick to compile all of the data they have collected from joint Dino Dig excavations over the years and to get it into publishable form. Snyder is also helping Southwestern to design a Dinosaur Exhibit.

Professor Valerie Lee published a book for young adults on the topic of loss titled

**When Sparrows Fall.** It is available at [teachservices.com](http://teachservices.com).

Professors David Nelsen and Aaron Corbit “wowed” visiting academy seniors recently with a snake and spider show. They also shared their animals with Southern students during a convocation earlier this month.

Our freshman General Biology I class is the largest in the history of Southern with 159 students.

The wall in-between the General Biology and Anatomy & Physiology labs has been renovated to now include a large window.

This greatly facilitates concurrent labs being held in the two rooms. Concurrent labs are taught there for 18 hours each week during this current semester.

Krista Bonney (senior biology major) and Professor Rick Norskov met with several health professionals at a physician’s home with President David Smith and the Advancement team. Krista talked about her experiences as a biology senior who just returned from a mission trip, how she did research two years ago at Erlanger, and how she really enjoyed the spiritual application of design in the Human Anatomy class at Southern.



# Students in Service

## Teaching In Thailand

### *What made you decide to become a student missionary?*

**Pablo:** While growing up in the Adventist church, I was exposed to many stories of various Adventist missionaries who dedicated their lives to spreading the gospel all around the world. I was captivated by the idea of serving God in a foreign place. Attending Southern Adventist University opened up whole new opportunities for me to serve. Whether it be the local community service day, uQuest mission trips, or long term opportunities, I knew I wanted to participate. So when I found out about student missionaries (SMs), it rekindled that deep desire in me to serve somewhere different and uncomfortable. And after much prayer, I realized that God was calling me to be a student missionary.

### *How did you end up in Thailand?*

**Pablo:** Thailand wasn't my first choice, actually. It wasn't even my second choice. After finishing the required class to be an SM, my friend Alphie and I were still applying to different places to serve for the upcoming year. Then we both left Southern and went our separate ways for the summer. We continued to work on our applications and went through the whole process of getting accepted, up to scheduling the necessary special training

for a specific location, when they informed me that they wouldn't accept either of us. That news was absolutely devastating. I felt that maybe God didn't want me to serve as an SM anymore. I recall phoning Alphie and letting him know what had happened. I asked him if we should maybe return to Southern in August. He said absolutely not, that God was merely closing a window in order to open a door elsewhere for us. So we decided to send our applications to one more place: Bangkok, Thailand. With God's help, we were accepted and finally left for our location about a month into Southern's academic school year.

### *What was the most difficult thing about living in a foreign country?*

**Pablo:** I think the hardest part for me, personally, was the inability to communicate with everyone. I was raised bilingual in America, so growing up I took for granted the ability to speak with almost everyone I met. This was not the case in Thailand. Tonal languages, such as Thai, are very difficult for a non-tonal speaker to learn. The idea that a word can have completely different meanings, depending on how I said it, was not something I liked. So communication could be very difficult at times. This became very apparent when we had to teach young children who knew only the Thai language. Trying to teach English and learn Thai at the same time was a very humbling experience.

### *What is one thing you miss from Thailand?*

**Pablo:** I miss the friends I made. Food,



Teacher, Pablo Huerfano, was invested and interested in what his students had to say.

culture, or scenery cannot compare to the relationships I developed in Thailand. The impact people had on me is, without a doubt, the most important thing about my year as a student missionary. I recently heard that when people go somewhere as missionaries, they usually expect to help change the locals but, more often than not, the reverse is true. I made some lifelong friends in Thailand. They will forever be a part of my life in the way they helped me to grow as a person. I hope I had at least a quarter of the impact on their lives that they had on mine, and I miss them all very much.

### *How will your experience in Thailand benefit you in your future careers?*

**Alphie:** Both Pablo and I are biology majors who plan on one day working in the medical field as physicians. Some of my friends wonder why they should become an SM, since they are planning to be doctors--or why they should become an English as a Second Language (ESL) teacher, as I did. Here are some reasons: First, I was able to work on my communication skills. Five days a week, I had to plan lessons and teach English to students of all ages. Second, I learned how to share accurate, factual information in a crystal-clear way which is a skill that I will forever find useful. As a student and, God-willing, a future doctor, I will need to teach for the rest of my life and help those

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Southern biology student, Alpie Rotinsulu, taught English to children in Thailand, which will increase the number of opportunities they will have in the professional world.

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around me. As a doctor, I will need to be able to share with my patients and their families exactly what the problem is and what they can do moving forward.

### *What did you learn from your students?*

**Alphie:** From my students, I learned more about people—God’s children. To be honest, the students often challenged my patience. Have you ever tried to teach English to a four-year-old who would rather be kicking a soccer ball outside? I had to take a deep breath and step back in order to deal with one such boy. I also learned how to be determined. How much my students learned in class was largely up to me. I was determined to see improvements

and worked hard to make it possible. Next, I learned to love. I had three middle-school girls during my whole time teaching in



Small class sizes allowed more personal interactions between teacher, Alphie Rotinsulu, and his students.

Bangkok. They were loud, preoccupied with boys, and seemed to not want to learn

English. But they always smiled at the beginning and end of every class. They sang “*I’ve Got Peace Like a River*” at the beginning of class and prayed at the end of class after a long week. They experienced God. I felt love for them and, finally, love for God and the simplicity that comes with His promises.

***There really is a place for anyone, regardless of interests, age, or life experience, to be a missionary. Life lessons are waiting to be learned, and lives are waiting to be touched. Will you answer the call?***

*By Alphie Rotinsulu & Pablo Huerfano*

## Alumni Spotlight

### “Southern Experience” Prepares Jack McClarty for Life of Service

S. Jack McClarty was born and raised in Collegedale. After attending Collegedale Academy, he graduated from Southern Adventist University in 1999. Besides being a biology major, he was also a Southern Scholar. Both of his parents worked at Southern. His father, Jack McClarty, worked from 1972-1997 as a music professor (band director) and later as Vice President for Development and Alumni; his mother, Wilma McClarty, was an English professor from 1972-2007.

McClarty graduated from Loma Linda University School of Medicine in 2003. He finished anesthesiology residency from Emory University in Atlanta in 2007. Since that time, he’s worked with Anesthesiology Consultants Exchange in Chattanooga. He works primarily at Erlanger Hospital and currently serves as the Chief of Anesthesia at Erlanger East Hospital.

Outside of work, he serves on church committees, the Collegedale Parks and Recreation board, the Collegedale Tomorrow Foundation board, Southern Board of Trustees, and the East Tennessee Symphony Orchestra (ETSO) board of directors. He enjoyed serving as president

of the ETSO and also plays trumpet in the orchestra and occasionally subs with Southern’s concert band. He also provides guest lectures for the University of Tennessee/Erlanger Nurse Anesthesia program as well as at Southern.

McClarty enjoys other extracurricular activities, such as, traveling with family, playing golf/softball, and, most recently, participating in triathlons and a marathon this fall.

He and his wife, Susan (Clarke), ‘02,

met at Southern and then reunited at Loma Linda University where she earned her master’s degree in Marriage and Family Therapy.

McClarty says that he was very pleased with his “Southern Experience” and felt well-prepared for his graduate education and life of service outside the classroom. He is passionate about Southern and Adventist education in general.

*By Rick Norskov*



Jack and his wife, Susie, relax with their children, Boston and Siena, at Glacier National Park in Montana.



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ADVENTIST UNIVERSITY

Power for Mind & Soul

Biology/Allied Health  
Department  
PO Box 370  
Collegedale, TN 37315  
1.800.SOUTHERN  
www.southern.edu



## In the Beginning

The Biology Department hallways in Hickman Science Center are home to museum-quality displays featuring a creationist worldview. The Origins Exhibit beautifully captures the complexity of the cell, amazing evidences of design in nature, and a biblically consistent interpretation of the fossil record.

Since the exhibit was completed in 2012, it has attracted countless students, alumni, school groups and other members of the community. It has also been incorporated into our biology origins course, Issues in Natural Science and Religion. Information from the hallway displays is used for class assignments and lectures.

Preparations are now being made to share this course—and the Origins Exhibit—with a wider audience around

the world. The Faith and Science Council of the General Conference provided a grant to produce a powerpoint series and a study guide for use in an online course that would be available worldwide. Our next project is to create a virtual museum that will supplement and strengthen the presentations for that course.

If you are on campus and have not yet toured the exhibit, please come for a visit! We would love for you to see the hallway displays and to partner with us

in making the information they contain available to those who are unable to personally experience them.



Students in Professor Rick Norskov's First Year Experience Southern Connections class take a selfie.

