

Discover

Celebrating research and creativity at Northern Kentucky University

vol. six, 2014

**She guides undergraduates
in designing their futures**

Media informatics director Renee Human
knows games aren't just for playing around

NKU NORTHERN
KENTUCKY
UNIVERSITY

a message from the president

As our young university moves nearer to completing its first half century, those of us who are its stewards today are obligated to remember why our region and our state invested in the idea of a Northern Kentucky University.

Measured in dollars, the investment was significant, and it remains so. Measured in expectations, the investment was even greater – even bolder. Our predecessors expected NKU to provide the kind of education that would elevate our region economically and intellectually.

To monitor and measure the return on that investment, NKU has a new strategic plan with student success as its paramount goal. As the plan recognizes, no one thing assures student success. We must be inclusive, affordable, innovative, and accessible. But foremost, we must be excellent teachers. To be excellent teachers, we must be devoted to research, because what happens in our laboratories and libraries informs and improves what happens in our classrooms.

With that in mind, I invite you to enjoy this edition of *Discover*, a magazine devoted to research at NKU. All six of our colleges – Education and Human Services, Health Professions, Arts and Sciences, Law, Business, and Informatics – are devoted to research that advances human knowledge and understanding, as the stories that follow demonstrate.

Whether revisiting Chaucer or evaluating the interactions between gamers and game developers, the research by NKU's faculty is creative and held in high regard by national and international peers. Our academic team's research also reflects another value in the new strategic plan: it is transdisciplinary. That is, while steeped in a core discipline, it often connects to other disciplines because big problems aren't solved within silos. Indeed, big ideas are generated when diverse expertise is joined in a common endeavor.

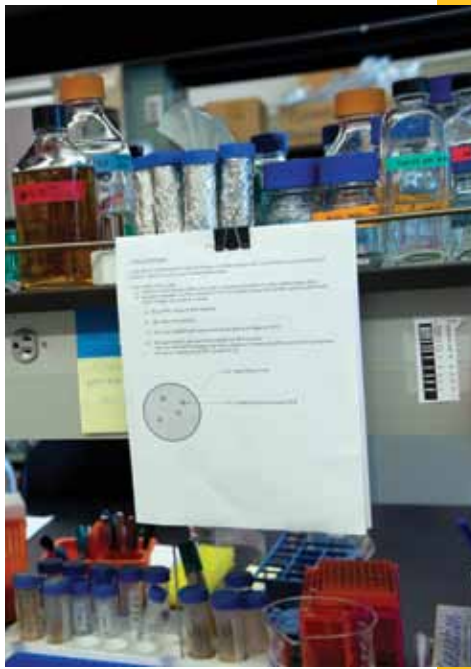
You'll also read about our effort to boost student research, an effort consistent with our strategic focus on student success. As our new provost Sue Ott Rowlands observes in her insightful Q&A on pages 10-11, "Being able to define a research question, design a methodology, test theories, and articulate outcomes is an essential part of a quality undergraduate education."

In the end, that is what our stewardship of the NKU vision is all about: delivering an education of the highest quality to students whose future we are here to empower and whose passion we are here to ignite.

Sincerely,

G. Mearns

Geoffrey S. Mearns
President



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Provost Sue Ott Rowlands sees research as inseparable from the university's academic mission to teach, as faculty use one to enhance the other. Research, she believes, is essential as the university seeks to contribute to the region's wellbeing and growth.

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SUPPORTING RESEARCH AND CREATIVITY

NKU's faculty and staff submitted 166 applications for grants from July 1, 2012, through June 30, 2013.

Those totaled \$15,041,351.

111 grants were awarded, totaling \$7,149,666.

The largest award received was \$729,200.

Source: Office of Research, Grants, and Contracts





With student success as NKU's top objective, student research is getting more emphasis

By Greg Paeth



Chemistry. History. Psychology.

If the question is where to find undergraduate research at Northern Kentucky University, the answer is all of the above, and most other disciplines as well.

Chemistry? Derek Gibbs, who graduated last year, spent time in the lab creating molecules for new materials that might increase the efficiency of solar panels. Panels in use today absorb at best 10 percent of the energy radiated by the sun.

History? Two students, senior Andrew Boehringer and December 2013 graduate Shane Winslow, are writing a book about the history of Cincinnati's public stairways and how the steps have influenced the culture and economy of the city's hilly neighborhoods. Their public lecture in March packed Cincinnati's Mercantile Library to capacity.

Psychology? Students in Dr. Cecile Marczynski's research lab tested the intoxicating effects of combining energy drinks and alcohol, with results that have confirmed the dangers of that mix. Their work attracted national attention in *Time Magazine* and *Science Daily* and on CNN and ABC.

"I would put undergraduate research as No. 1. It is the most complete expression of the academic experience.... Students all of a sudden have purpose, and they all of a sudden see themselves moving in a direction that has some relationship to their career. They become passionate about it."

**– Dr. Jan Hillard
NKU, associate provost**

Such research, guided by faculty mentors to teach methods and rigor, is essential to an outstanding baccalaureate experience, said Provost Sue Ott Rowlands.

"It helps prepare undergraduates for success in a variety of careers," Ott Rowlands said. She is new to NKU, having arrived in January from Virginia Tech University, where she was dean of the College of Liberal Arts and Human Sciences. She arrives with a reputation of support for undergraduate research – and some ideas about how to expand its footprint at NKU.

"It's important to put resources into institutional priorities," said Ott Rowlands, listing such things as faculty release time, travel funds, and grants that might be marshaled to pursue NKU's research goals.

"Faculty need time to conduct their research and to mentor student researchers. Students must have access to facilities and faculty mentors. And both faculty and students must be supported in opportunities to disseminate their research – through conference presentations, peer-reviewed journals, etc."

As NKU boosts support for undergraduate research, it does so from a position of strength. By reputation and by the numbers, NKU can already claim an academic culture where undergraduates are encouraged to work with faculty on research projects. Overall, the university uses an internal survey to track the percentage of



A strategic imperative

students who have worked on at least one research project with a faculty member. About 18 percent report doing so by their senior year, a number that benchmarks well.

In two of the basic sciences, the numbers are even more impressive. Out of the approximately 200 students majoring in chemistry, 120 have done research in the last three years. In biology, with 400 majors, about half did research during the last school year.

Dr. Keith Walters, who chairs the chemistry department, says the benefits that accrue to student success – in college and after – explain why his department has been devoted to student-faculty research collaborations for at least 25 years.

“That has become a part of our department’s culture,” Walters said.

“So if I came here with a research idea that involved going and locking myself in the lab and doing it myself – that’s not what we’re about. If you don’t involve undergraduates in your work, that’s not compatible with our department.”

Undergraduate research, Walters added, shouldn’t be confused with a lab exercise. The experience is deeper than replicating an experiment to test whether a student has learned something already known to the world.

“Undergraduate research is just like the research you’d see in other institutions, where there is truly a problem that has to be solved but we don’t know the answer. We only think we have ideas about what the answer would be,” Walters said.

With a base built, NKU is now looking to do more. The university’s new five-year strategic plan – approved by the Board of Regents in November – includes repeated references to the value of research, both directly (“expand opportunities for students to engage in research” and “secure external grants that support research”) and indirectly, by calling for more applied learning. Much of the research at NKU is applied research.

Other pieces are being put in place as well:

- At the direction of President Geoffrey Mearns, meetings of the university’s governing frequently board include an undergraduate research presentation. Dennis Repenning, who chairs the board, is among those who have been impressed. “It was so clear that the students were completely immersed in their work and that it had impacted their lives in a really positive way,” Repenning said, reacting to one recent presentation.
- Mearns also singled out student research in his speech for the 2014 spring semester convocation in January, celebrating its transformative power in recounting the story of senior John Crum, whose research on cancer and genetics was advised by his biology professor, Dr. Erin Strome (see “Lessons in the Lab,” page 9).
- The Undergraduate Research Council was created in 2012 and is providing a more formal organizational structure for the work while encouraging and nurturing it through a grant program that was launched last fall, when \$12,300 was awarded to faculty members for 11 projects. An office of undergraduate research also is being considered.
- The university’s Six@Six Lecture Series, which in its first three years featured NKU professors discussing their research at local libraries, museums, and arts centers, was expanded for the 2013-14 season to include six more lectures by NKU students talking about their research.

NKU’s commitment to student research – and especially to opportunities for undergraduates – was celebrated in *Times Higher Education* (THE), a British journal devoted to higher education news. Writing for THE, Dr. Felipe Fernández-Armesto, a history professor at University of Notre Dame, mentioned NKU students Boehringer and Winslow and their stairways research.

Fernández-Armesto argued that rigor in America’s top universities – the Ivy League institutions – is more about

Student Mark Vater on why NKU’s investment in undergraduate research is important

“It inspires interest and curiosity in future scientists. Science overall can be a pretty vast, intimidating field. There’s a lot we don’t know, a lot we are simply trying to ascertain, and even issues we are unsure of how to go about testing.

“Planning and executing projects in undergraduate labs help students to build a strong basis of confidence and passion, which is important for success later on down the road, when experiments and ideas become more complex and involved.”

Senior Mark Vater and his faculty mentor, Dr. Kristy Hopfensperger, are in the early stages of an experiment inside the greenhouses of NKU’s Herrmann Natural Science Center, where Vater will examine whether ryegrass can offset an herbicide’s concentration in runoff.

Atrazine and ryegrass are just half the story

You can inquire of Mark Vater about his research, but be prepared to be lost unless you are steeped in the natural processes of pollutant degradation.

“In particular,” Vater explained, “I’m attempting to examine how a common species of ryegrass, *Lolium perenne*, degrades the herbicide atrazine – which is endocrine-disruptive and a groundwater pollutant in the United States.... The driving hypothesis is that with a differing soil particle size, resultant activity in the rhizosphere may influence the overall amount of atrazine neutralized.”

That may be hard to follow. This isn’t. It’s his answer when asked about the thrill of research:

“I can only say how exhilarating it is to see a brainchild of mine become a tested question by my own hands. It’s something small, yet highly specific, and I continue to learn more about myself and the world around me with each step taken. I would say I have an undeniable love affair with life science.”

Vater, a senior, is double majoring in environmental science and biology. He is one of about 200 biology majors at Northern Kentucky University who are conducting undergraduate research in partnership with a faculty mentor. Vater’s faculty adviser for his research is Dr. Kristy Hopfensperger, who also worked with him last year to apply for a U.S. Environmental Protection Agency fellowship under the agency’s 30-year-old Greater Research Opportunities program.

When the awards were announced last fall, Vater’s name was among the 33 from around the country listed. GRO for short, the program provides up to \$50,000 in funding for research, tuition, books, and travel to academic conferences, plus a place in an EPA summer internship.

Vater’s experiments, designed to examine how ryegrass (commonly planted after a stream or riparian area is restored) and atrazine (a toxic herbicide widely used in the United States) interact, is important real-world work.

“Atrazine can feminize male amphibians and fish and has been linked to cancer in humans. After farmers apply this herbicide to their fields, it washes into local streams and rivers with storm events,” Hopfensperger said.

“Mark is studying to see how that may affect plantings along stream and river banks.”

What he learns could guide streamside restorations and improve the understanding of where best to plant ryegrass to reduce atrazine concentrations.



Time and CNN are among the media outlets that have taken note of research by Dr. Cecile Marczyński and her students in her psychology lab, where the risks of alcohol use are examined.

admission than what happens afterward. It's the lesser known local universities, he wrote, that are making "an alchemical difference that ignites unsuspected genius.... These institutions have shoestring budgets and few or no historic advantages but make up for their deficiencies by the commitment of the teachers, the ambition of the students, and the zeal of the communities that surround them." He singled out NKU's Department of History and Geography.

Dr. Jonathan Reynolds, the history professor who advised the stairway researchers, is quick to spread credit. Both students were, for example, members of Phi Alpha Theta National History Honor Society, which creates a peer-to-peer support system for history students interested in research. The NKU chapter has won so many national awards (best chapter 21 times, including last year) that the commendations crowd the chapter's website. Along with the peer support, Reynolds said, there is faculty support – and not from just one or two professors. That's not the given it might seem it would be.

"In all too many schools – many of them considered elite – students are considered turf, and the idea of helping 'somebody else's student' would be anathema. We don't work like that, either as a department or as a university," said Reynolds, who teaches courses in African, world, and Middle Eastern history as well historical methods and courses in NKU's honors program.

Other departments match history's commitment. In biological sciences, four students working with Dr. Kristi Haik, who chairs the department, and postdoctoral fellow Dr. Ruth Hemmer, have done research on the harmfulness of nanoparticles coated with different surfactants – that is, detergents. Haik also has other questions about nanoparticles, including whether those that are infused into clothing to resist stains might have harmful effects. So the opportunities for additional research await.



Senior John Crum's research on cancer and genetics was advised by his biology professor, Dr. Erin Strome.

Lessons in the lab are also life lessons

President Geoffrey Mearns kicked off the spring 2014 semester with a campus speech outlining the new NKU strategic plan, which calls for more student research guided by faculty mentors. It's not just the research that NKU values, Mearns said, but also "the abiding value of the personal relationship between a teacher and a student." Here is an excerpt:

At the September meeting of the Board of Regents, one of our outstanding students, John Crum, gave a presentation about his undergraduate research project. John is a senior, majoring in biology. His faculty adviser is Dr. Erin Strome, a biology professor.

John's research examined whether specific genes increase the risk of developing cancer. John conducted research to determine whether one particular gene – MSH5 – increases the likelihood that a person will develop breast cancer.

Now, as a former English major who barely passed introductory biology in college, I must confess that I didn't understand all of the technical details of John's presentation. But, in my defense, it was a pretty sophisticated presentation. There was one aspect of his presentation, though, that I fully comprehended – and that I will never forget.

At the end of the presentation, John told the regents how his undergraduate research experience changed his life – not just his educational experience here at NKU, but his life. John admitted that, prior to this experience, he was very introverted. In fact, he hadn't even been able to talk to a faculty member about the possibility of supervising his project.

According to John, he finally summoned the courage and sent an email to Professor Strome. She then interviewed him, and she agreed to supervise his research project. John described the simple act of sending an email as one of the best decisions he had made in his life. He said, "I met people I'll never forget. Friends for life. I've made memories."

With respect to his adviser, John told the regents that Professor Strome was "really fun, yet still professional." Then he said, Professor Strome "demanded more responsibility for my actions than anybody else in my life. She has helped me to be more confident, yet stay humble."

John concluded his remarks by describing his research experience with Professor Strome this way: "It has not only made me a better scientist but also a better person."

Among the most creative faculty-student collaborations ongoing at NKU is the development of an iPad application for testing water quality in the field. Called Water Quality Pro, the app is meant to arm lay people – citizen scientists – with a tool they can take streamside to collect and analyze environmental health and then send to a central database.

The app's development has involved faculty and students from biology, computer science, and visual arts, thus reflecting another goal in NKU's new strategic plan to foster transdisciplinary research. The goal is driven by the idea that real problems rarely are solved within the silo of one discipline but rather by thinkers from several.

Explaining the importance of the app in a journal article they are preparing with the students who worked side by side with them on it, Drs. Miriam Steinitz-Kannan and Richard D. Durtsche, both of whom are biology professors, write:

Today, more than ever, maintaining water quality is critical as human populations rise and land use continues to increase all over the world. Pollutants such as agricultural and industrial runoff that result from an increase in anthropogenic land use cause water quality to decline. Because of this, bioassessment and chemical monitoring of watersheds all over the world are crucial to determine the quality of water.

In short, water quality is a hot topic, as is the citizen science movement and its ability to use newer technologies to crowdsource environmental data collection.

"In all too many schools – many of them considered elite – students are considered turf, and the idea of helping 'somebody else's student' would be anathema. We don't work like that, either as a department or as a university."

**– Dr. Jonathan Reynolds
NKU, history professor**

The origins of NKU's embrace of undergraduate research go back at least a dozen years to when an NKU faculty team visited Harvard to see how one of the country's most prestigious universities supports undergraduate research.

"They came back with a vision for building undergraduate research into a distinguishing feature of NKU," said Dr. Jan Hillard, NKU's associate provost for research, graduate studies, and regional stewardship. One idea borrowed from Harvard became NKU's Celebration of Student Research and Creativity, marking its 13th incarnation this year. The 2013 event featured 37 oral presentations from 15 different disciplines and 174 poster presentations from 20 different disciplines. Around 500 students and 150 faculty members participated in the five-day event.

"I would put it as No. 1," Hillard said of undergraduate research. "It is the most complete expression of the academic experience."

He is drawn to the notion of "the apprentice scholar" – that is, learning an academic discipline and the rigors of research just as tradesmen once learned blacksmithing or carpentry from a mentor. Students, he said, succeed at college not only because they take classes but also because they are able from early on to appreciate the scholarly effort. They learn how they fit in and how their work fits into the academy.

In his view – a view reflected across NKU – immersing students in the scholarly process cannot wait until graduate school. It needs to start as soon as possible.

"That's what keeps students here," Hillard said. "They all of a sudden have purpose, and they all of a sudden see themselves moving in a direction that has some relationship to their career. They become passionate about it. That's why I put it No. 1."

Q&A with NKU’S chief academic officer

Provost Sue Ott Rowlands arrived at NKU in January with a reputation for supporting undergraduate research. She intends the same commitment here.

About Sue Ott Rowlands

- She served as dean of the College of Liberal Arts and Human Sciences at the Virginia Polytechnic Institute and State University from 2007 through last year, when NKU hired her as provost and vice president of academic affairs.
- At Virginia Tech, she oversaw a \$40 million annual budget, 900 faculty and staff, more than a dozen academic programs, and 18 research centers. Her college had 3,800 undergraduate and 1,600 graduate students.
- At NKU as provost and executive vice president for academic affairs, she oversees about 1,150 faculty and staff and an annual budget of more than \$120 million.
- The deans of the university’s six colleges – Arts and Sciences, Business, Education and Human Services, Informatics, Health Professions, and Law – report to her, as do several other academic units on campus.
- Ott Rowlands replaces Dr. Gail Wells, who served more than 30 years at NKU and nearly a decade as provost.
- Before coming to Virginia Tech, Ott Rowlands spent five years at the University of Toledo, first as professor and chair of the Department of Theatre and Film and then two years as interim dean of the College of Arts and Sciences.



Q **How important is research to a university and to the community it serves – and why?**

Research, broadly defined, is the creation of new knowledge and, as such, extends the work being done in the classroom setting to a broader audience. This extension of knowledge benefits the university through the support and retention of outstanding faculty members who are able to integrate their own research explorations with their teaching.

University-based research benefits the broader regional and, indeed, global community through enhancements in the quality of life. Translational, or applied, research provides direct benefit in the fields of health, technology, and education, for example, as new knowledge moves from the lab into the community, contributing to social and individual wellbeing and transformation.

Q **How do teaching and research complement one another?**

Faculty engaged in both teaching and research will use one activity to enhance the other. Knowledge gained in the lab – or studio or archives – is infused into the curriculum and thereby contributes to the teaching mission of the university.

Likewise, the process of teaching adds to a faculty member’s deeper understanding of the subject matter, often directly impacting the work being done outside of the classroom. Students and faculty alike gain much from the integration of teaching and research. In fact, I don’t believe you can actually separate the two as distinct activities – they are inextricably intertwined in my thinking.

Q **Some research is pure, some applied. Should one of those matter more for a regional university, such as NKU?**

I’m not convinced that the distinction between pure and applied research is a useful distinction. Certainly applied, or translational, research has at its core the intent to move from the theoretical realm into the realm of application. We usually think of applied research as creating new healthcare strategies, medical breakthroughs, technology innovations, and/or workforce development efforts.

But theoretical research, or research motivated purely by the creation of new knowledge, shouldn’t be diminished and adds greatly to our understanding of what it means to be human and how our societies can function successfully.

Creative research, both pure and applied, greatly adds to the quality of life. While one might argue that NKU’s mission lends itself more readily to applied research, a great university must support both.

Q **Here, and elsewhere in the nation, there is an increasing emphasis on research by undergraduates, often side by side with faculty members. Is this a trend you embrace?**

Absolutely. At my previous institution we established a college-level Undergraduate Research Institute, which provided leadership to these initiatives throughout the institution.... Being able to define a research question, design a methodology, test theories, and articulate outcomes is an essential part of a quality undergraduate education.

Q **As provost, how do you see yourself leading NKU’s faculty and students toward more research – and are there particular directions you would like to take?**

I hope to provide institutional support at current or enhanced levels through competitive internal funding programs, support for external funding proposals, student research at both the undergraduate and graduate levels, and higher visibility for NKU’s research efforts.

Q **Our community, like many where a university is located, has a high expectation that NKU will be a community resource. Research directly links to that expectation, would you agree?**

Indeed. NKU must stay strong to its commitment to the northern Kentucky region, and as a major contributor to the wellbeing and growth in the region it must continue to support and, indeed, expand its research in areas that directly benefit the community.

Again, as the creation of new knowledge, research is essential to a region’s resiliency, and when that research is driven out into the community in a translational fashion, the entire region will benefit.

Q **People may not think of theater, your discipline, as one where research is ingrained. But research and theater have some history with one another, do they not?**

People often think of bench science when they think of research. I’ve been a strong advocate of a broader definition of research throughout my career. Research is the act of expanding our understanding of a topic and, as such, exists in any and all disciplines.

It might be more useful to think of research as the umbrella activity of creating new knowledge and that the way in which this knowledge is disseminated is what varies from discipline to discipline. So scholarship could well describe the research activity of faculty in the humanities (e.g., the publication of books and articles). Social research might best describe the quantitative methods used by social scientists. And creative activity can accurately describe the making of new artistic works, such as performances and compositions, or the new interpretations of previously created work.

As an actor and director, I find myself engaged first in historic and linguistic research as I examine a text and then in creative research as I find ways to express through the body, voice, and imagination the character I’m playing. It’s a fascinating process.

The important thing is that we not privilege one type of research over another. All are important and contribute to our greater understanding of our past while preparing us to function successfully in the future.

Seeing a Middle English text through a 21st-century lens



Perplexed by *The Canterbury Tales*? Not to worry. NKU English professor Tamara O'Callaghan and a colleague are working on a smartphone solution to guide you through Chaucer's classic.

By Greg Paeth

Some 600 years ago, scribes and illuminators began work on a specially commissioned rendition of *The Canterbury Tales*. Their task was to enliven the text with a script and drawings that both reflected and complemented Geoffrey Chaucer's stories.

Over the centuries, their artistry has had lasting significance. The pages of one of the best-known versions of the *Tales*, the Ellesmere Manuscript, are laden with an ornate script. The accompanying illustrations have a primitive resonance and provide abundant information about the people who became subjects of Chaucer's tales.

Today, Northern Kentucky University English professor Dr. Tamara O'Callaghan has similar goals in using a technology known as augmented reality to bring new dimensions to how readers experience Chaucer's classic.

Relatively new to virtual technology, augmented reality allows O'Callaghan to add images, sound, and supplemental text to a printed page. The added components, though invisible to the eye, are brought to life when a smart phone or tablet hovers over the page. Imagine a newspaper in which a photograph of last night's baseball game triggers video highlights of the game. Likewise, O'Callaghan can creatively augment a page of Chaucer. A reader might be able to listen as the text page is read aloud with proper medieval pronunciation. Or perhaps a map pops up, plotting the route Chaucer's pilgrims followed to Canterbury.

O'Callaghan, whose field is medieval literature and historical linguistics, and her research partner, Dr. Andrea

Harbin, an English professor at the State University of New York in Cortland, call their project "The Augmented Palimpsest: Engaging Students through AR Encounters with the Past." A palimpsest is a medieval manuscript page whose visible text masks an underlying original text that often can be restored by modern technology. What's hidden is revealed.

The technical part of what O'Callaghan and Harbin are doing involves coding image markers called fiducials on the pages of Chaucer. An example of a simple fiducial is a QR (quick response) code found inside those ubiquitous, grid-like squares on advertising materials, signs, and product displays.

The fiducials that O'Callaghan and Harbin embed can't be seen by the human eye but can be detected by a properly programmed smart device. She and Harbin coauthored an article about using fiducials in teaching early literature for the journal *Studies in Medieval and Renaissance Teaching*. They also plan to discuss their work in an upcoming conference of The New Chaucer Society in Reykjavik, Iceland.

But their work isn't only about technology. The heart of it is their belief that Chaucer – though written during the waning years of the 14th century – remains relevant to today's classrooms. The technology is just a way to make it more accessible.

"In teaching Chaucer, we are not only teaching literature that is still complex and engaging. We are also teaching



To see a demonstration of augmented reality on an iPad or iPhone, first download the Layar app from iTunes and then scan the picture of Chaucer. Here is the link: appstore.com/layarbv.

"We want to create a highly immersive learning experience for students with 3-D enhancements large enough to be walked around and viewed from multiple angles."

**– Dr. Tamara O'Callaghan
NKU, English professor**

our students about the history of the English language through their encounter with Chaucer and Middle English," Harbin said.

"We are teaching them about medieval English history and culture and how those both shape, and are shaped by, Chaucer and his contemporaries."

Chaucer's writing challenges the modern reader given the complexity of Middle English. Spelling had not been standardized. There were few rules of grammar. The pronunciation of Middle English was decidedly different from today's English because of a phenomenon known as the "Great Vowel Shift" that began in the 15th century, roughly between the time when *the Canterbury Tales* first appeared and when William Shakespeare began to publish his plays.

Augmented reality is here ... for real

It begins simply.

A bird outlined in the customary black ink of a coloring book stands against a background of plants. The page is an open invitation to any child with an imagination and a box of crayons.

But there's more to this coloring book page.

Wave an iPad or other smart device over it, and magic happens. On the screen of the device, the bird arises in three dimensions, not two. It moves about, hunting for dinner. It draws a worm from the ground. Gulp. The worm is gone. The page, no longer static, has become an animated mini-movie, created in the colors chosen by the child.



In another example, a merry-go-round spins. In others, fireworks sizzle, dancers twirl, planes pirouette through cottony clouds, and dragons breathe fire.

So it goes with augmented reality, a rapidly emerging technology that combines the real world and computer-generated images and information.

The coloring book pages and the computer application to bring them to life were developed by the New Zealand startup Puteko Ltd. under the brand name colAR. It is among the multitude of augmented-reality apps exploding into the market. It's also the go-to app when Dr. Tamara O'Callaghan wants to demonstrate how she'll use augmented reality to add new dimensions to Geoffrey Chaucer's 600-year-old classic *The Canterbury Tales*.

The technology's promise seems endless. A Google search leaves the uninitiated feeling as though they've discovered the next revolution in their daily lives. Reality is about to become a mash-up of what the world presents to our eyes and ears combined with what augmented reality can add to it from the boundless memories of our computers.

As *The New York Times* personal technology writer Kit Eaton wrote, "It may be worth getting familiar with augmented reality not because it's fun and occasionally useful but because it is the future of mobile devices."

That was written in 2012. Two years later, the future is here.



A spiny-tailed lizard attracts a crowd at the Cincinnati Zoo.

A textbook case of going beyond the textbook

Everybody loves the zoo, but why? Does love translate into financial support? Why or why not? When the Cincinnati Zoo wanted answers, it asked Aron Levin’s marketing students to do the research.

By Joe Wessels

Why do donors donate, buyers buy, visitors visit, and listeners listen?

Answering such questions is the specialty of Dr. Aron Levin and his students, whether for a social service agency, a zoo, a pizzeria, or a public radio station.

Levin, a Northern Kentucky University marketing professor, is the director of the Marketing Research Partnership Program, or MRPP, created in 2001 to add a

“Presenting a project that I had worked so hard on to a table full of executives that could actually use the insights I uncovered was amazing.”

**– Taylor Pohlman
2013 NKU marketing graduate**

real-world experience to NKU’s marketing classrooms. His students dig into the minds of customers to provide professional-level research to the likes of the Cincinnati Zoo, WNKU, and Mama Mimi’s Pizzeria.

“If you think about the things you are reading in newspapers, universities need to be more accountable,”

Levin said. “They need to train students to help them get careers. I feel like my program does so many of those things.”

The Cincinnati Zoo and Botanical Garden – considered one of the top three zoos in the country – hired Levin’s students in the fall of 2013 to determine what motivates people to donate money to the zoo or what makes them decline to give.

The zoo’s advertising agency recommended Levin’s program, which costs a client \$1,500 versus perhaps \$30,000 for similar research by a major marketing firm. The fee covers basic expenses but is only paid if an organization is happy with the students’ work.

With 215 full-time employees (double that in summer), 2,000 hungry animals (some with exotic diets), more than 75 acres of land, and 1.4 million visitors per year to keep happy, the zoo tries to mind its spending carefully. The zoo also counts on county tax support for some of its \$33 million annual budget, and Hamilton County voters expect a frugal, efficient operation.

“Could I go to a research group and pay a lot of money? Sure,” said Chad Yelton, the zoo’s public relations and marketing director. “But when you’re a nonprofit like the zoo, that’s not an option.”

The zoo provided students with 58,000 email addresses of visitors and members. The zoo was curious: Were these friends of the zoo aware that it is a nonprofit? If they donated to the zoo above and beyond buying tickets or paying membership fees, why did they give? If they had not donated, why not? What attracted them to the zoo in the first place? Yelton visited Levin’s class, sharing exactly what the zoo hoped to get from the research.

“Could I go to a research group and pay a lot of money? Sure. But when you’re a nonprofit like the zoo, that’s not an option.”

**– Chad Yelton
Cincinnati Zoo, marketing director**

“We’re just trying to understand visitors, our members, and our donors and their behaviors,” Yelton said. “We unleashed the stat team. They asked some great questions and got some great results.”

About 16,500 people opened the email. Of those, about 4,000 responded. Results showed nearly everyone was aware of the zoo’s nonprofit status. But to many respondents, the county property tax supporting the zoo equated to a donation already. Others considered their membership fee a donation. More than 60 percent indicated they aren’t financially able to donate.

The students found males are more likely to give than females. Married couples are less likely to give than singles. As for specific reasons for donating, 84 percent cited their love for the animals and the zoo. About as many, 83 percent, gave because they consider the zoo a valuable community resource. And 51 percent liked one of the perks of being a donor – more exclusive access to animals and zookeepers.

Just as the research helps the client, it also benefits students. Taylor Pohlman, 22, graduated from NKU in December 2013 with a degree in marketing. She was on the MRPP team that did the zoo research. She credits the hands-on experience with giving her confidence that she could handle complex marketing research for a real client.

“Presenting a project that I had worked so hard on to a table full of executives that could actually use the insights I uncovered was amazing,” Pohlman said.

Mike Miller also participated in MRPP, landing an internship and later a job through the experience. His final exam was a poster detailing the rationale behind his research. He used it afterward for a job interview.

“We did a project from start to finish. We had client contact. It wasn’t fake. We actually had deliverables that we produced for the client,” Miller said.

With big consumer research-focused companies – like Procter & Gamble, Kroger Co., and Macy’s – headquartered locally, having students ready to go to work is critical. Several smaller companies have sprung up to support the larger companies, providing even more jobs.

“If you want to be in research, this is the town to do it,” Levin said.

Though the MRPP students have finished their work with the zoo, the zoo hasn’t finished using the students’ work. The zoo’s managers reference the findings often and look for ways to integrate them.

“There was a value to them, and there was a value to me. We both got something out of it. We learned a lot, and I think the students learned a lot,” Yelton said.



Building 21st-century job skills

Doris Shaw – marketing, economics, and sports business department chair – on the value of the Marketing Research Partnership Program

“It’s one of the proudest points for the college of business. It’s a model for how to build a program.... It provides critical thinking skills, analytical skills, creative skills, and professional acumen, which includes writing and building those skills within our students so they can go into the workplace.”

Aron Levin is a professor of marketing and director of the Marketing Research Partnership Program. He has been on the faculty at Northern Kentucky University since 2000.

Education: He received his Ph.D. from University of Kentucky, 1997; M.B.A., Northern Illinois University, 1991; B.S., University of Iowa, 1989.



Crossing a cultural divide to better health



Healthcare professionals can serve African immigrants more effectively in the U.S. by first understanding how life differs for them in their homelands.

By Feoshia H. Davis

When Africans immigrate to the United States, they bring along their cultural attitudes on health and wellness. Back home, no one carves out time for the gym or a run. Nor is reading the latest book on nutrition a priority in a culture where food is prepared fresh at home.

That can cause health problem for Africans living in America, where more conveniences contribute to poorer eating habits and sedentary routines.

"They're going through a transition of lifestyle. In Africa, when you get up in the morning, physical activity is built into the day. There are a lot more conveniences here," said Dr. Matthew Asare, a professor of health education at Northern Kentucky University who is originally from Ghana in West Africa.

In a paper being prepared for publication, "Health programs and healthy lifestyle: Black males perspective," Asare found that home culture can make it difficult to offer useful health information to immigrant populations. Black African males can be particularly hard to reach and assess.

There were 1.6 million African immigrants in the U.S. in 2010, according to the Census. African men outnumber women about two to one. While there are no official data for total population of African immigrants in our region, the Ghanaian Association of Greater Cincinnati estimates the population at 15,000.

Many came from the rural parts of their native countries where most work is agricultural and often manual – weeding, felling trees, and planting crops. Less dependent on cars than in America, people walk miles to work and shop.

The shift in lifestyle, among other factors, can lead to increased chronic disease in black African male immigrants, Asare found. His research focused on African male immigrant populations to find a deeper understanding of U.S. statistics showing that a disproportionately high number of black males suffer from chronic disease.

Centers for Disease Control and Prevention statistics show that 40 percent of black males are more likely to die early from heart disease, compared to 21 percent among white males.

It is also well documented that black males are more likely to suffer from Type 2 diabetes, high blood pressure, cirrhosis, and other preventable diseases.

What Asare wanted to know is how a subset of those statistics – African immigrants – fares. He also examined their awareness of and response to U.S. nutrition and exercise guidelines.

Asare's work wasn't as simple as combing through existing records. He had to create a record. He sought volunteers from the Cincinnati area, finding first-generation immigrants through African community groups, churches, and businesses.

"It's so difficult in the U.S. to get health information on Africans," Asare said. "When you go to the doctor, for statistical purposes, immigrant Africans in America are considered black. That includes African immigrants, other black immigrants, and African Americans. It's very difficult to get information on a specific country of origin. African Americans and Africans in America have some differences culturally, and we wanted to explore that."



For African immigrants to the United States, the cultural adjustments aren't just language and culture. There also are adjustments required to stay healthy.

Additional research on African immigrants

His research on the health repercussions for African immigrants as they adapt to American culture is not Dr. Matthew Asare's first significant research on this population.

In 2011 while working on his doctorate at the University of Cincinnati and teaching at NKU, Asare released findings that AIDS – an epidemic in Africa – remains a public health concern even after African immigrants come to the United States, where AIDS education and awareness is better than in their home cultures.

Surveying over 400 African immigrants in Ohio, Asare looked at attitudes toward condoms, monogamy, and sexual communication. He found evidence of risky behaviors, including 12 percent who reported multiple partners. The majority of those respondents did not use condoms.

Overall, 51 percent said they had been sexually active in the past month but had not used a condom.

Asare also found that immigrants most acclimated to American culture were most likely to practice safe sex and most likely to communicate with their partners.



Asare's research, based on face-to-face interviews, examined health attitudes and practices of 50 men. His aim was to find better ways to reach immigrant males when it comes to the importance of healthy eating, exercise, and regular checkups.

The men came from several African countries. Many of them, 20, came from Ghana. Others were from Nigeria, Togo, Cameroon, Côte d'Ivoire, Kenya, and Uganda. Their average age was 38. Most were college educated and were either employed or self-employed. Almost all had at least a high school diploma.

Using a well-tested sampling method, Asare set out to find the health attitudes and practices of participants. He wanted to answer these specific questions:

- What are the participants' current physical activity, nutrition, and access of preventive care behaviors?
- What are the determinants of black males' physical activity, nutrition, and access of preventive care behaviors?
- What are the participants' perceptions about black males' physical activity, nutrition, and access of preventive care behaviors?
- What are the culturally appropriate ways to promote healthy lifestyle (physical activity or good eating habits) and preventive care (health screening) among black males?

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NKU nursing students check blood pressure and (opposite page) height and BMI at a clinic in Covington's City Heights neighborhood.



"You don't have a doctor, so where do you go? The emergency room is your health provider," Foster said. "If you can get people to use a registered nurse instead of running off to the emergency room for every problem, that is quite dramatic."

Once the word spread about the clinic at Transitions, similar agencies wanted one, too: WRAP house, Welcome House, Women's Crisis Center. So other grants were sought and more clinics set up at those agencies.

Studying the problems and charting the services showed the need was greatest in the afternoon and early evening – when the women and children were coming in and out, and the aches and pains of yet another day on the streets, or of fighting the effects of dire poverty, were grinding down the bodies, Foster said.

The Madison Avenue Christian Church in Covington had a meal program for the poor and homeless on Monday nights. Church members saw the people also had a need for healthcare. So a nurse was sent to the church on Monday nights to do health assessments and first aid and to take care of immediate healthcare needs – providing things such as Band-Aids, tampons, and socks. When you spend all day on the streets, socks are an essential.

More requests came. The agency that runs public housing in Covington called, and the Nurse Advocacy Center set up a clinic in a Methodist church in City Heights, one of the agency's apartment complexes. The Emergency Cold Shelter on Scott Street in Covington asked for help for the homeless men there. The Horsemen's Benevolent and Protective Association, which represents the backside workers at racetracks, asked for help at Turfway Park in Florence.

The clinics are staffed with volunteer nurses, students, and others. Money comes from a variety of sources – grants, donations, sales of art or crafts made by people living in the shelters, and NKU. With the continuing need evident, the university set up and incorporated the Nurse Advocacy Center, said Foster, who runs the programs in addition to teaching in the department of nursing.



Real-world needs provide a laboratory for learning

Born of one nursing student's inquiry into healthcare for the underserved, the Nurse Advocacy Center now hones clinical and research skills across disciplines.

By Paul Long

Nurses have long practiced outside hospitals and doctors' offices, caring for sailors and soldiers in battle, the elderly and shut-in in their homes, children at schools, and the poverty-stricken wherever they are found.

That's the legacy of Florence Nightingale, the founder of modern nursing, and it's a legacy carried on by the Nurse Advocacy Center for the Underserved at Northern Kentucky University.

"If you think back to where nursing came from – how nursing was established in this country – it's all about being in the community," said Cindy Foster, an assistant professor of nursing and the director of the center. "We weren't in the hospitals. Nursing was done in the homes and in the communities."

The program sends registered nurses, along with students from the various programs in the College of Health Professions, to clinics set up to serve the indigent, the homeless, and the working poor. The demand is breathtaking, Foster said. Few days pass without a call from a church, a homeless shelter, a community center, or a food bank seeking services. Nursing students analyzed the program's impact. They found that it had dramatically cut the number of emergency room visits by the thousands of people served.

Foster said people who struggle against poverty ignore their own health until they're falling over in pain. They'll take their children to the doctor – free or low-cost Medicaid covers the children – but ignore their own needs.

"If you don't have shelter, or you don't have food on the table, and there are three hungry children at home, it's hard to say you're going to make a doctor's appointment next week and get that screening done," Foster said.

NKU's program was founded about a decade ago as the result of a student's interest in the healthcare of women and children in homeless shelters. The student wanted to know if such women and children regularly saw a doctor or visited a clinic. What, she wondered, was poverty's impact on physical health?

When her research confirmed the breadth of the need, the university sought and received a grant to put a health clinic in a shelter run by Transitions Inc., an agency that treats people addicted to drugs and alcohol.

Two nurses, along with student aides, attended to immediate health needs and taught clients how to take care of themselves. They diagnosed problems such as sore throats and headaches. After a year, Foster said, visits from the shelter to the emergency room – where care is most expensive – dropped 70 percent.

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Students Megan Mullins (front right) and Megan Stevenson use a fingerstick to obtain a small blood specimen so a patient can learn her blood glucose level.

Trying to close a gap in the system

Professor Cindy Foster on the value, and the limits, of providing community nursing to people who are homeless:

"A lot of what we do is chronic disease management – diabetes, hypertension. A lot of it is just immediate healthcare needs. With the homeless, sometimes it's just treating the injuries they sustain from being out on the street. In the summer, it's hydration needs.

"We can begin to help them. That's the thing about community nursing. You can get someone to the point where they want to take care of themselves. People who are in this population, they haven't been served for a long time. They haven't had access to healthcare. They feel beaten down by the system. So a lot of the work that we do is to try to get people up and get them to care about themselves."



Nerd extroverts know they can't rest on their laurels



Media informatics is a field on the move, and Renee Human is making sure her students keep up.

By Paul Long

To teach in informatics, a wormhole in the space-time continuum might help. You could jump ahead a few months, figure out what's happening, and then hurry back to the present to plan for what's ahead.

Or maybe the wormhole wouldn't help. By the time you got back, others would be onto the next big thing. The field moves that fast.

Northern Kentucky University assistant professor Renee Human understands the speed of change in computer science and information technology. She directs NKU's media informatics program in the College of Informatics – a program she set up, which meant

“My research is based off an idea I had in her class. She took a little idea I had and made me believe it could be more. She's with me every step of the way in my research.”

**– Nick McKay
NKU media informatics student**

designing courses as well as teaching them. It's not a job for someone discomforted by change.

“Even when I teach the same classes, they're different from when I taught them before. The introductory

Renee Human directs the media informatics program at NKU, a multidisciplinary course of study that, as she explains, brings together “communication, coding and programming, maybe a little computer science, and design and art.”



web class that I redeveloped two years ago has been refashioned three times in three years,” Human said.

Like her field, Human is a rapid mover, given to one thought after the other, moving from one (her many projects) to another (her students and their projects) and another (her travels to conferences, meetings, and seminars) and yet one more (linking designers and developers to help businesses begin or expand).

It's part of what makes her the kind of educator that one of her students, Nick McKay, describes as not only passionate about what she's teaches but also able to “pass that very same fire onto their students.” McKay is studying how video games might improve education, perhaps with competition and rewards for continued advancement.

“My research is based off an idea I had in her class,” he said. “I decided to make it the focus of my final paper. Two days after turning it in, I get an email from Renee doing backflips over my paper. She took a little idea I had and made me believe it could be more. She's with me every step of the way in my research.”

Broadly speaking, informatics is the academic field that studies the structure, algorithms, behavior, and interactions of natural (that's us) and artificial (that's computers) systems that store, process, access, and communicate information. NKU got a jump on the field by opening its College of Informatics in 2006 and, within it, the Department of Communication, where Human's media informatics program resides.

NKU's media informatics program began by teaching the versatile skills required for multimedia journalism. Where future reporters were once taught to report, write, and maybe take pictures, they soon were also being taught to record sound and video and how to blend all of it together. Appropriate to a field always on the move, media informatics has morphed again. It now pulls together communication, design, psychology, and computer science.

Human is a media informatics prototype. She started as a writer and liked to hang out with the artists and designers. She discovered she had a knack for software. She worked for a company that developed and maintained websites. Then she was asked to teach a class at a community college. Turned out, she loved teaching.

She stays connected to her old world. She's an Adobe Education Leader, advising the company on product design. That positions her to be among the first to use new technologies in the classroom. She's an academic member of the National Center for Women in Technology and one of the founding organizers of Mashcomm36, an annual 36-hour contest each February that pairs eight businesses with teams of students to solve digital public relations challenges.

Not playing around

In the world of media, video games have quietly become a serious business. And worthy of serious research.

By Daniel Walton

Grand Theft Auto V entered the videogame market last fall with a bang: \$1 billion in sales in three days – more money in less time than any other entertainment launch in history.

The wider world of business took notice, though not for any interest in fictional car thieves. Rather, if games for entertainment could register returns like that, then what might be in store for the “gamification” of other sectors? Gaming is being used, for example, for employee training and other corporate applications.

As the sector grows, so do questions about how designers interact with users. Therein lies the sweet spot of Dr. Renee Human's research: how the communication (or lack of it) between players and developers can influence a game's success.

Among the games she's studied is Maxis Software's *Spore*, whose players design creatures for world conquest. Players customize virtual warriors with horns, wings, and the like. Dissatisfied with the available options, some players make changes – or “mods” – to *Spore*'s characters.

The end user license agreement, or EULA, that a user accepts as a condition of playing the game expressly forbids mods. But Human found that Maxis often makes use of mods in official updates to *Spore*. In one example, players modded the game to allow asymmetrical features on their creatures, such as a horn on the left side but not the right. Maxis soon came out with a patch that enabled players to do that, though without acknowledging the original mod.

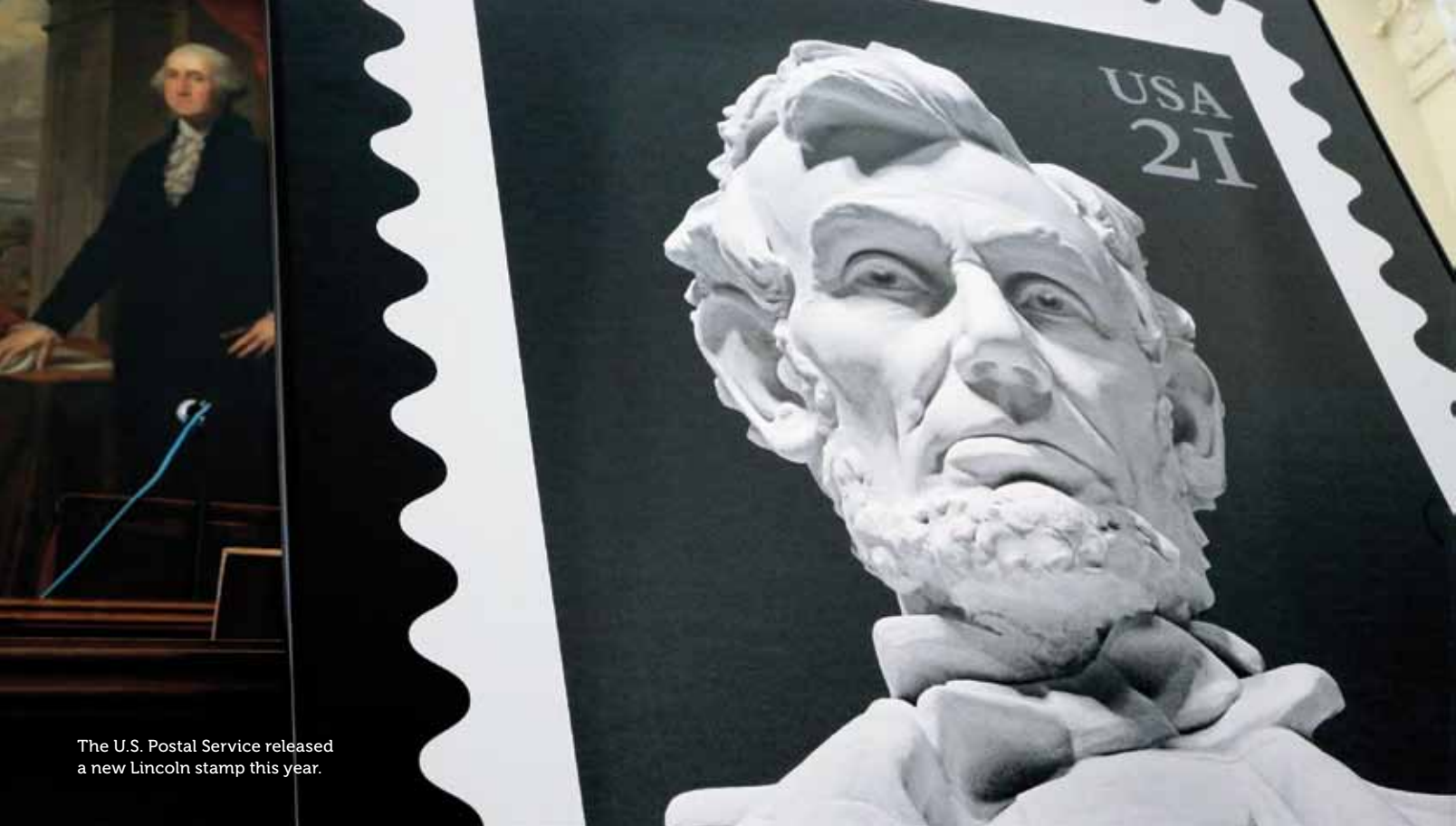
Since, Human explains, “most developers can't speak to you unless it's totally anonymous,” she instead analyzed thousands of messages by players on *Spore*'s Internet forums. Users with names like Burningwolf converse with the likes of Dragonboy, instructing each other. Although modding is forbidden by the EULA, nearly 1,700 player messages referenced the practice, and developers did not discourage the discussion by deleting posts or issuing warnings.

Human interpreted these mixed messages in the framework of coordinated management of meaning theory, a philosophy of communications research that emphasizes the way in which responses shape the meaning of a conversation.

The insights into how users influence game modifications inform the development of the gaming applications that Human is programming at NKU. Not as flashy as *Spore*, her apps use gaming for more productive purposes, such as health education. Players earn points in one app by completing real-world exercise tasks like stretching or short walks.

Human is incorporating mods by encouraging users to submit their own activities. “Well, I skydived. Does that count for points?” she imagines a player asking. “Yeah, that counts for a bunch of points!”

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The U.S. Postal Service released a new Lincoln stamp this year.

Honestly, Abe was quite a lawyer

He's been played on screen by Henry Fonda and Daniel Day-Lewis. He's been cast as a vampire slayer. Books about him fill library shelves. The \$5 bill and the penny carry his image, as does a new postage stamp. But what do we know about Lincoln the lawyer? A lot more than you might think, now that law professor Roger Billings is on the case.

By Feoshia H. Davis

At least 16,000 books have been published on Abraham Lincoln, more than on any other American. Yet for all the inquiry, our 16th president still has the power to perplex, just as he did in his own time.

His presidency, his death, his views on slavery – even his marriage – continue to be dissected and debated nearly 150 years after his assassination.

"Lincoln did not have close friends he confided in. Even the friends he had didn't fully understand what made him tick, and that's surprising to people today," said Roger Billings, a professor at Northern Kentucky University's Chase College of Law.

"Lincoln is a chameleon. He shows many colors to his personality. No one has yet figured out which one is genuine."

But Billings, like other Lincoln scholars, has not stopped trying. For speeches at conferences, for journal articles, and in a book collecting scholarly essays on Lincoln's legal career, Billings has studied the historical record to understand a president whose life sometimes seems to contradict his own legacy.

How, for example, could the man who would become the Great Emancipator represent a slave owner trying to retrieve a runaway slave and her four children? Billings explored that question in a paper, "The Matson Slave Case: A Countercultural View", that he delivered last September to the 15th annual Conference on Illinois History.

The case, which unfolded in 1847, has given some writers reason to question Lincoln's commitment to the antislavery cause, but Billings sees instead a lawyer who, though deeply troubled by human bondage, is committed to legal ethics that obligate attorneys to vigorously represent a client's interests even when the attorney's values and the client's conflict.

As Billings explains in the paper, which he's now preparing for publication, the future president did not jump at a chance to represent a slave owner. Nor did he shy from it. Lincoln, Billings argues, felt a primary obligation to the law – the same obligation that would, during his presidency, lead him to hold a free election in the midst of war and guide him toward an emancipation strategy that violated neither the law nor the Constitution. Nothing, as one of

Billings' like-minded colleagues has said, was more sacred to Lincoln than the law.

That observation, from preeminent Lincoln scholar Harold Holzer, is in the introductory essay of Billings' book, *Abraham Lincoln, Esq.: The Legal Career of America's Greatest President*, published by the University Press of Kentucky in 2010. Billings is coeditor of the book and wrote three of the essays collected in it. As the book shows, understanding Lincoln the lawyer has become a particular fascination of Billings.

"We evaluated his career, looking into the special law practices that hadn't really been discussed before. That included his time as a real estate lawyer and his ethics as a lawyer. We dedicated two chapters to his Washington years in constitutional and international law," Billings said.

Billings and his cowriters make abundant use of *The Law Practice of Abraham Lincoln*, a newly available online repository of more than 100,000 letters, legal briefs, court records, diaries, newspaper stories, and other documents related to Lincoln's legal career that scholars are just beginning to plumb. The site is part of a larger project of the Illinois Historic Preservation Agency and the Abraham Lincoln Presidential Library and Museum to collect, publish, and annotate the written record of Lincoln's life.

"Lincoln did not have close friends he confided in. Even the friends he had didn't fully understand what made him tick, and that's surprising to people today."

**– Roger Billings
NKU, law professor**

"There have been more than 5,000 cases discovered that he handled and 100,000 documents. I'm one of the people using this treasure trove of documents to analyze Lincoln's law career," Billings said.

Like many Lincoln enthusiasts, Billings' interest was ignited by Lincoln's Civil War years. While serving in the Army himself, Billings grew more interested in the former commander-in-chief. He started collecting Lincoln books.

"I'd go to used book shops and buy five or six at a time," Billings recalled.

"There are just a few hundred books really worth collecting out of the thousands written. I have many of those. This has been a hobby, but as a professor I've become interested academically in the law career of Abraham Lincoln."

Lincoln's 25-year law career had been largely overlooked or misconstrued. Lincoln, who had no formal legal schooling, was a practicing attorney from 1836 to 1861. Licensed in Illinois, he argued cases in county, state, and federal courts. He used his country charm to sway opinion. The charm and his backwoods upbringing belied his keen legal mind.

"Lincoln's style was to be folksy with the jury," Billings said. "But he was sly as a fox, conceding points to the other side, except for the one point most likely to win his case. He was an extraordinary lawyer, because the best lawyers in the state welcomed a chance to work with him. He



Contradiction or consistency?

In his paper *The Matson Slave Case: A Countercultural View*, Chase law professor Roger Billings argues nothing was inconsistent in Lincoln, then a 38-year-old trial attorney, defending a slave owner in an Illinois courtroom in 1847. Here are excerpts from the paper, which notes that Lincoln first attempted to side with the slave:

"He offered his services to Dr. Hiram Rutherford, who was backing the slave, Jane Bryant, but Dr. Rutherford turned Lincoln down. In all other similar cases Lincoln did represent the slave. The real reason Lincoln took Matson, the slave owner, as a client is simply that it was his business to represent people. Lawyers took business as it came along.

"...Lincoln was bound by the unwritten rule since colonial times that lawyers should represent unpopular clients zealously. To find an example of representation of an unpopular client in colonial times one needs only to consider the founding father John Adams. As a scholar of early American history, Lincoln must have known that Adams defended British soldiers accused of murdering colonists, an incident called the Boston Massacre. Because most of his fellow colonists hated the British, Adams' courageous defense of British soldiers was subject to criticism as morally wrong.

"...The fact that Lincoln took the Matson side of the case did not mean that Lincoln abandoned his antislavery beliefs. Lincoln was known to be antislavery, yet his professionalism enabled him to take the side of a slave owner. And his belief in Whig principles to uphold the rule of law as a barrier against chaos allowed him to represent a slave owner in spite of his moral convictions."

Roger D. Billings, Jr., is a professor of law and legal studies and has been on the faculty at Northern Kentucky University Chase College of Law since 1972.

Education: He received his J.D. from University of Akron, 1969; B.A., Wabash College, 1959.



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“It’s one of the reasons you can read post-1550 English and get a pretty good sense of what the characters in a Shakespeare play are saying, but you read Chaucer, who was really just 200 years earlier, and you can’t understand it so easily,” O’Callaghan said.

Harbin and O’Callaghan met in 2012 when they attended a digital humanities summer institute sponsored by the National Endowment for the Humanities at University of Illinois Urbana-Champaign and the University of South Carolina. They were among 25 academics and graduate students selected from across the United States, Canada, and Europe to attend the institute, which explored ways to use new technology in teaching, research, and scholarship in humanities-based disciplines.

After discussing projects that might dovetail with the objectives of the institute, O’Callaghan and Harbin settled on Chaucer and augmented reality. They surveyed the existing scholarly work to assure that their idea was fresh. It was.

Last August, they returned to UIUC for another week of research and talks with people working at the school’s National Center for Supercomputing Applications. Afterward, they applied for an NEH grant to work on a prototype. This spring, they were awarded the grant. The \$59,924 Digital Humanities Start-Up Grant is the largest NEH grant awarded to NKU to date.

The vision O’Callaghan and Harbin have for their work goes beyond the smaller-scale use of augmented reality. They imagine, for instance, a virtual model of Canterbury Cathedral with a roof the viewer could remove to see inside. Already, that is technically possible, if challenging. But O’Callaghan also points out that what’s possible with augmented reality today is only a precursor of what’s to come, which makes this a perfect time to imagine the next possibilities.

“We want to create a highly immersive learning experience for students with 3-D enhancements large enough to be walked around and viewed from multiple angles,” O’Callaghan said.

The project will present opportunities for involvement with other fields of study, including history, media studies, art, language, literature, archeology, architecture, and, of course, computer science. Such transdisciplinary scholarship is being encouraged at NKU, including in the new strategic plan as it seeks to deconstruct academic isolation in favor of collaboration among scholars from different departments.

As Provost Sue Ott Rowlands put it, “Tamara’s research is a wonderful example of the university’s new strategic plan coming to life. This innovative work is an inspiration to us all as we begin to build a culture that is supportive of transdisciplinary initiatives.”

Tamara F. O’Callaghan is an associate professor of medieval literature and historical linguistics in the Department of English. She has been at Northern Kentucky University since 1997.

Education: She has a Ph.D. in medieval studies (1995), M.A. in English (1988), and B.A. (Hons.) in English (1986) from University of Toronto.

The center’s direct service to the community is its most obvious benefit, but built into the center’s structure is an academic purpose as students apply their learning. They sharpen clinical skills, learn to collaborate with each other and with community partners, and learn how to interact with real patients and real illness.

They also design research protocols to investigate and address community health challenges. In their senior year, nursing students at NKU must complete a capstone project for their degree. The Nurse Advocacy Center is a pathway for those who want to look into the community for such research. One student, for example, helped write the rules for the clinic at City Heights – doing the research, planning the program, and writing a policy manual.

“So she can look back and note that she helped set up a free clinic at a public housing project,” Foster said. “We call it a ‘change project.’ They go into a situation and they make some type of change or some kind of research that benefits that community. So that’s their capstone.”

In another instance, an anti-obesity project enrolled girls at City Heights in cooking classes and fitness workouts for eight months in an attempt to evaluate whether the girls’ self-esteem could be boosted along with their knowledge and concern about their own health.

“We barely scratched the surface,” Foster said.

But there were improvements and some important findings that could be applied to future programs:

- The girls reported fewer social barriers to fitness.
- They were more likely to engage in exercise if it fit their needs and likes – for instance, hip-hop dancing classes instead of calisthenics.
- They liked doing the workouts together in a safe place.
- They liked having proper, well-fit workout clothes.

It’s not just nursing students who are involved, Foster said. Respiratory therapy students have worked with health fairs, doing lung function tests and talking to people about how to quit smoking. Students from the counseling, social work, and leadership departments on campus have worked as counselors at some of the sites.

“So we try to bring in students from all disciplines, because that’s what it takes nowadays – an interdisciplinary approach to healthcare, especially with the underserved population,” Foster said. “They have so many needs, not just the physical medical care.”

Cindy Foster is an assistant professor of nursing and has been at Northern Kentucky University since 2006. She has been director of the Nurse Advocacy Center for the Underserved for seven years.

Education: She earned her M.S. from University of Minnesota and her B.S.N. from Wright State University where she was a founding member of Wright’s chapter of Sigma Theta Tau International Honor Society of Nursing.

In addition to limitations of time and money that prevent many people from adopting healthy practices, African men had misconceptions about their own health and habits. In the area of exercise, 78 percent said they were physically active. But when asked what kind of, and how much, exercise they got each week, responses painted a different picture. More than half said they didn’t exercise regularly. There were different reasons for this, but recurring themes were that it was a waste of time and working kept them active.

One man explained: “It is not our culture to have a schedule for exercise. In Africa, our daily activities involved exercise. We walk to almost everywhere we go. We walk to farm, walk to fetch water. In short, everything we do involves exercise. I know a few friends who don’t care about physical activity or exercise.”

Cultural differences exist in the areas of nutrition and health screenings as well. Ninety-four percent of the men said they have a healthy eating behavior and prefer to cook and eat traditional African food. However, when questioned further, many admitted to occasionally eating fast food, especially when away from home. Many also said traditional African foods are expensive, hard to find, and difficult to prepare.

In addition, about 80 percent said they never check the nutritional components of food. As one man said, “I don’t know anything about nutritional components. I just eat what my mother introduced to me, and I believe they are healthy, too.”

Just over half of the men said they took advantage of health screening for conditions like diabetes, cancer, and high blood pressure. Although many of those who didn’t avail themselves said lack of insurance was a contributing factor, culture played a role as well.

“Some see going for a physical checkup as sometimes not good for their health,” Asare said.

“If they’re told they have diabetes, cancer, or any health problem, they’d rather not know. Some of the participants were concerned that, if they went for a checkup, the doctors’ findings might somehow hasten death. So when they wake up and they feel OK, they’d rather go on with their lives. They don’t worry about knowing their health status.”

In concluding his research, Asare found that the men would respond most to culturally informed health programs that explain why certain health behaviors are needed and important. When health professionals truly understand the immigrant culture and lifestyle, those messages should be much better received, he found through interviews.

These educational messages “should focus on the importance of physical activity versus physical inactivity and the general benefits of physical activity; emphasize physical activity as a preventive mechanism and not as a cure; and promote time management and sports like soccer,” Asare wrote.

Health professionals should focus on nutritional education as it relates to traditional foods and the importance of a balanced diet, smaller portions, and reducing fried food intake, he added.

Asare plans to make his research available to the region’s health professionals to help them understand the African point of view on food and exercise – and how that understanding can be a starting point for those who want to reach African immigrants.

“If the health community understands that things like physical activity are different from an African point of view, you can get deeper into understanding their health issues,” Asare said.

“My hope is that the health community will understand the underlying cultural issues that underpin African immigrants’ decisions. Then they will be more willing to listen.”

Matthew Asare has been an assistant professor in kinesiology at Northern Kentucky University since 2010.

Education: He has a Ph.D. from University of Cincinnati, (2011); an M.A. from Ohio University (2001); M.B.A. from Ohio University (2000).

loved trial work but not office work. He did draft hundreds of excellent office work documents such as deeds and mortgages, however.”

If Lincoln had a fault as a lawyer, perhaps it was his filing system. As Billings reports in *Abraham Lincoln, Esq.*, the man whose name would become synonymous with freedom took liberties with office records, sometimes filing them in his stovepipe hat and too often misplacing them.

Billings’ book and other work on Lincoln have made him a popular speaker. He has organized symposiums and spoken at Gettysburg, Pa., in addition to Springfield. He sits on the boards of Lincoln associations in both cities.

“These associations are dedicated to the study and accurate preservation of Lincoln’s legacy,” Billings said.

“There is a lot of information about Lincoln that has been published, and not all of it is historically accurate. I’m happy to add to the accurate understanding of Lincoln’s legal career.”



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Her students are in the technology vanguard, too. Daniel Wilcox recently presented a paper exploring how and why players become immersed in video games. Is it the graphics, the realism, or the storyline? Like McKay, Wilcox credits Human's encouragement.

"She has a way of bringing the best out in her students," Wilcox said.

"The specific paper I wrote would not exist were it not for Professor Human, who not only encouraged my line of research when first writing it but also took great interest when the topic of the paper began to evolve into what it is today."

Besides teaching the technology itself, Human also teaches her students the communication skills required to design applications users can use. She's a scholar in coordinated management of meaning theory, which combines philosophy, management, negotiation, and perception. Or as Human defines it: "You say something. I say something. What we create is something new and different."

It was invented to apply to business relationships and more recently has been worked into video game theory and design. The designers, artistic and creative, want to do something. The developers work on how to do it. Then they work together to create a whole.

Consider the 2010 Disney movie *Tangled* about tower-trapped Rapunzel and her magically long hair. It took lots of people working together to do what may have seemed small and simple: getting Rapunzel's hair to look

"Even when I teach the same classes, they're different from when I taught them before. The introductory web class that I redeveloped two years ago has been refashioned three times in three years."

– Renee Human
NKU, media informatics professor

natural. Hair, like grass, is among the more demanding things to render realistic in computer-generated images.

"So when the character moves, does the hair flow like it should? When the character steps on the grass, what kind of grass is it? Does it flatten all the way? Does the grass spring back up?" Human asked, explaining the challenge.

"It's the art driving the technology instead of the technology driving the art. So the artists are like, 'We want it to have this effect.' So the coders get in there and create the algorithms."

But remember the wormhole? The reason it would be handy is that what you learn about grass and hair today may not be what you need to know about grass and hair by the time to go to work.

"Half of what we teach you is that you're going to be figuring it out yourself," Human said.

And figuring it out means working with others. Forget about computer nerds sitting in the basement coding.

"We do a lot of teamwork," Human said. "It's like social computing, because you're interacting with so many people. It's a weird degree. In computer science, we like to say when those students walk out of the room,

you say 'hi' to them, and they're like this...." She looks downward, eyes averted.

Media informatics students? You can tell them, too, Human said: "We're extroverts. We're nerd extroverts."

Renee Human is an assistant professor and serves as the program director for media informatics.

Education: She has a B.A. in English from Wheaton College (1989) and an M.A. from University of Kentucky in Communication (2005). She also completed her coursework and qualifying exams toward her Ph.D. in communication at University of Kentucky and is working on her dissertation.



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From Lazarus lizards to Japanese hospitality

student research

Undergraduate research is highly valued and widely supported at Northern Kentucky University. Typically, student research is mentored by a professor. Each spring, many of the students involved in research over the past year report on their work during a weeklong celebration of student research and creativity. Here is a sample of what was presented April 15-19, 2013.

The Effect of Active Video Games on Heart Rate: Exercise or Not?

Students: Scott Brock, Josh Volpenhein, Brian Gish

Faculty sponsor: Gabriel Sanders, Kinesiology and Health

Abstract: Nintendo Wii Sports Boxing and Xbox Kinect Sports Boxing are considered active video games. However, the Wii requires only upper-body movements while the Kinect requires full-body movements for successful play. We assessed average and maximal heart rate during four conditions. Twenty students wore a heart rate monitor and participated in four 10-minute conditions: rest, treadmill walking at 3 mph, Wii Boxing, and Kinect Sports Boxing. **Finding:** It may be beneficial to play games such as Kinect Sports Boxing to increase physical intensity, as they have a potential to increase heart rate to 77 percent of maximum versus 62 percent for Wii Boxing and 55 percent for walking 3 mph on the treadmill.

Cloud-based P2P Web Caching for Mobile Devices

Student: Josh Newkirk

Faculty sponsor: Wei Hao, Computer Science

Abstract: More and more web traffic is generated from mobile devices. Perceived response time is an important performance metric for mobile user experience. Web caching is a widely used approach to reducing the response time. However, mobile devices often have limited storage space. In this research, we used cloud computing and peer-to-peer (P2P) techniques to design cloud-based P2P web caching. We performed experimental studies to validate our approach. **Finding:** Quantitative analysis validated this approach, showing improved response times.

Omotenashi: Japanese Hospitality

Student: Misun Kim

Faculty sponsor: Yasue Kuwahara, Communication

Abstract: Many foreigners who visit Japan talk about the distinguished experience of Japanese hospitality. The way they are served in Japan is completely different from that of other countries. Meanwhile, this service spirit of Japan is not limited to hotels and restaurants but is also present in every store. This service mindset is called "Omotenashi." In recent years, Omotenashi has been adapted by the business world. For example, Shiseido (a Japanese cosmetic company) set up Omotenashi marketing strategies. This study examined the concept and the use of Omotenashi in contemporary Japan. **Finding:** Omotenashi can be an effective business strategy, since its ability to satisfy customers and earn customer loyalty increase the company's profitability.

Diurnal Activities and Metabolism of the Lazarus Lizard (*Podarcis muralis*) as an Introduced Species

Students: Wesley Parsons, Mitch Mercer

Faculty sponsor: Richard Durtsche, Biological Sciences

Abstract: A founder population (10 individuals) of Lazarus lizard (*Podarcis muralis*), introduced from Italy in 1952, has since grown exponentially throughout Greater Cincinnati, where they thrive in urbanized saxicolous microhabitats. Our research evaluated the niche of these introduced lizards to determine if they 1) occupy a vacant urban niche and 2) pose a threat to the local ecosystem. We studied the foraging ecology of these lizards as well as their time-activity budgets. **Finding:** Lazarus lizards occupy an unexploited niche in urban settings where they bask and move mostly in the sun elevated on rock walls, with maximal metabolic rates and sprint speeds between 33°C and 38°C.

Slave Narratives and Their Historical Significance

Student: Angelica Smith

Faculty sponsor: Michael Washington, History and Geography

Abstract: During the times of slavery, the treatment of Africans was unimaginable. A major problem was that no one in the North knew how badly slaves were being treated in the South until slaves began to write slave narratives. These narratives described the slaves' daily experiences. The purpose of the project was to describe the historical significance of the slave narrative. **Finding:** Slave narratives were the revelation to the North that slavery was truly a terrifying circumstance that blacks experienced. The narratives helped the abolitionist movement.

Synthesis of Fullerene Complexes via One-Pot Method for Solar Cell Applications

Student: Jessica Horn

Faculty sponsor: Keith Walters, Chemistry

Abstract: We set out to create a solar cell using the organic compound fullerene. Because these are macromolecules, they have excess electrons and therefore are good electron acceptors, which make them potential molecules for use in solar cells synthesis. The goal was to attach a metal as the electron donor that, when excited by a photon, would create energy for the solar cell. A functionalized fullerene is necessary for this system, and our work involved a one-pot Sonogashira coupling reaction, which might be a faster, more efficient way to prepare functionalized fullerenes and other compounds.

Finding: The one-pot process appears to improve reaction yields. However, the presence of side products have proven challenging in purifying the final product. The research is ongoing and expanding to see if that can be solved.

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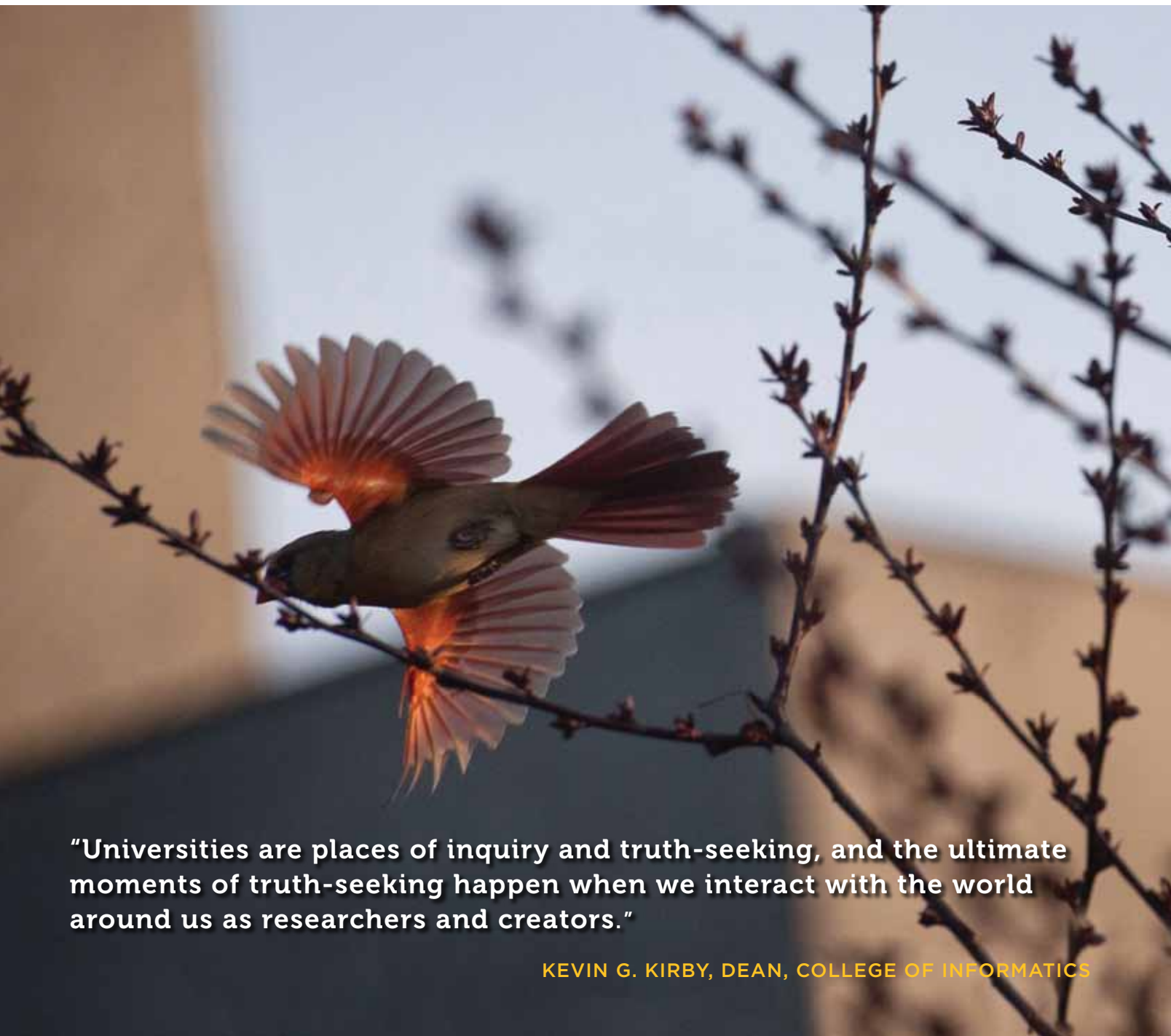
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