



2016-17 UNIVERSITY
ANNUAL REPORT

EXTRAORDINARY THINGS





When we challenge the norm,



EXTRAORDINARY

things happen.

We believe in creating good ideas that really help people.

Ideas that make a real difference. Ideas that challenge the norm. From our very beginning, we were compelled to focus on the communities we serve and to help bring about positive social change. This is how we enhance our students' education and spur innovation and creativity. This is how our unyielding focus on improving society turns into extraordinary accomplishments. Read about 10 things VCU did to challenge the norm to make a real difference this year.



Michael Rao, Ph.D., president, VCU and VCU Health System



In it for the long term

Residency program turns teacher turnover rate upside down in urban public schools

There's a constant turnover of teachers in urban schools. And a huge price tag because of it — approximately \$6 million each year for Richmond Public Schools, according to the 2014 National Commission on Teaching and America's Future Teacher Turnover Cost Calculator. Students bear an even heavier cost in terms of the lack of stability in schools and its negative impact on student achievement.

The Richmond Teacher Residency Program, a partnership between Richmond Public Schools and the VCU School of Education, is designed to end these educational inequalities. A selective urban graduate teacher residency program, it aims to create a sustainable

pipeline of highly effective and committed teachers. Already, 78 percent of all Richmond Teacher Residency Program graduates have been rated as extraordinary or above average on teacher effectiveness as compared with other teachers who did not graduate from the residency program but had comparable years of experience.

Similar to a medical residency, the teachers co-teach alongside a Richmond Public Schools master teacher for a year, receive extensive mentoring and support, earn a master's degree in education and commit to teach at least an additional three years in Richmond Public Schools.



105

new teachers have made an immediate impact in 31 of Richmond's most challenged public schools.

Lauren Kern, a third-year teacher of record teaching biology, began the Teacher Residency Program in 2014.

Connecting humanity

App addresses food insecurity through big data

Tatenda Ndambakuwa grew up in Zimbabwe and remembers the country's food crisis in 2008 that left her and millions of others facing starvation. Now, Ndambakuwa, a junior pursuing math and physics in the College of Humanities and Sciences, is seeking to prevent famines in Africa with the power of big data.

Ndambakuwa is co-founder of a startup that is developing a mobile application to allow African farmers to upload data about their farm's livestock and crop management, seed and feed access, milk production analysis, cattle pricing and other data points. The app will allow for real-time analyses of Africa's food production system, allowing policymakers and others to make the system far more efficient.

The startup, called "Dbuntu" — a combination of "data" with the Nguni Bantu term meaning

"humanity," or "the belief in a universal bond of sharing that connects all humanity" — is aiming to pilot its mobile application to 1 percent of the approximately 18,000 farmers in Zimbabwe.

Ndambakuwa, who previously worked on global nutrition issues as an intern at the U.S. Department of Agriculture, has, along with her Dbuntu teammates, recently enjoyed success at several national entrepreneurship competitions. The da Vinci Center provided Ndambakuwa with mentorship and financial support to compete. She will also take part in the 10th annual Clinton Global Initiative University, which supports students' projects focused on education, the environment and climate change, peace and human rights, poverty alleviation or public health.



"Ndambakuwa didn't solve just one problem by designing a mobile application, she solved multiple problems through employing an empathy-driven innovation process."

— Garret Westlake, executive director, VCU da Vinci Center

Tatenda Ndambakuwa, student entrepreneur



Green walls

An unconventional method to combat urban heat and improve air quality

unconventional

There's a natural beauty when science and art come together.

Engineering associate professor Stephen Fong, Ph.D., and VCUarts assistant professor Jon-Phillip Sheridan teamed up with Christopher Gough, Ph.D., an assistant professor of biology and carbon cycle expert, to tackle poor air quality in Richmond.

Together, they launched the Green Walls Course for undergraduates — thanks in part to the Institute for Contemporary Art, the Office of Sustainability and a \$5,000 undergraduate research grant from the VCU UROP Research Exposure Program.

The students developed detailed designs for green walls — vertical structures with living plants — to add aesthetics and carbon sequestration to urban settings.

They used repurposed, recycled and donated materials to create planters and structures in which the plants could grow and climb.

Their efforts inspired another group of VCU engineering, biology and arts students, also led by Fong and Sheridan, to partner with the Science Museum of Virginia, local nonprofits and a team from Portland State University to use a comprehensive mapping tool to identify urban heat islands. The tool overlays location-specific heat data with information about demographics, air pollution and features such as roads, buildings and trees. The results allowed the group to identify and analyze the city's hot spots, providing officials with the critical information to implement initiatives — such as green walls — in the city's most vulnerable areas first.



Plants in cities reduce the urban heat island effect, filter air pollution and provide habitats for critters. And providing more green space reduces human stress.

VCU students install green wall infrastructure.

Vitamin C?

VCU researchers are investigating the vitamin as a lifesaving treatment for sepsis

Kelsey Martin only recalls waking up in VCU's ICU restrained and confused about where she was.

Martin had near-fatal sepsis, and VCU Health physicians put her on cardiopulmonary bypass and gave her intravenous vitamin C. The treatment is part of an ongoing, multicenter clinical trial to treat septic lung injury, examining intravenous vitamin C, a water-soluble vitamin present in citrus fruit. Within seven days of receiving treatment, Martin was on the road to recovery.

Sepsis results from the body's overwhelming and life-threatening response to infection. More than 350,000 Americans die annually from sepsis.

Alpha A. (Berry) Fowler III, M.D., a professor in the pulmonary/critical care division in the VCU School of Medicine, began work in 2013 as principal investigator to determine

the extent to which high doses of intravenous vitamin C could effectively treat septic lung injury. Fowler's research is supported by a \$3.2 million National Institutes of Health grant and built on 10 years of work by research colleague Ramesh Natarajan, Ph.D., a professor in the pulmonary/critical care division.

Fowler noted these research results could have worldwide implications for sepsis treatment. Currently, 161 patients are enrolled in the trial. Previous work by Fowler and his colleagues showed high doses of vitamin C prevented sepsis-induced inflammatory responses. Placebo patients not receiving vitamin C had a mortality of 62 percent. Four days of vitamin C treatment reduced patient mortality to 38 percent.

lifesaving



If vitamin C treatment is successful, then this therapy invented at VCU will save lives across the world.

Alpha A. (Berry) Fowler III, M.D.



real world application

Smartphone app will create a new training method for future nurse anesthetists

An interdisciplinary team is creating a virtual training tool for future nurse anesthetists.

The idea for the Vitals Anesthesia app originated with Coffee Bourne, M.S.N.A., D.N.A.P., while a nurse anesthesia doctoral student at VCU. The team, which won best pitch at the Henry Ford Entrepreneurship Academy, is solving for an ongoing training issue — there is currently no way to troubleshoot, role-play or experiment with various scenarios nurse anesthetists experience on the job. In a real-world setting, students can't exactly give a patient a drug and see what happens.

But by playing a simulation game, students can get a feel for what it would be like to handle emergency situations and solve problems while racing the clock.

In addition to students from the Department of Nurse Anesthesia in the School of Allied Health Professions, the team includes undergraduate and graduate students in the schools of Engineering, the Arts and Business, and is part of VCU's Vertically Integrated Projects program.

Carol Fung, Ph.D., assistant professor of computer science, said her students are introduced to the field of nurse anesthesia as they study app development. Nurse anesthesia students, meanwhile, have been watching digital arts students redesign the interface to give it a professional polish. And business students are delving into the potential market for the app. Since graduation, three team members have created an entrepreneurial venture.



The gaming app will change the way nurse anesthesia students prepare for the real world.

Vitals Anesthesia originator, Coffee Bourne, discusses plans for the app.

Age in place **transforming**

Transforming health care for older adults

The Richmond Health and Wellness Program, led by Pam Parsons, director of practice and community engagement in the School of Nursing, is a community-based care coordination initiative to improve the health of older adults in the city of Richmond and help them remain independent in their home settings. The program has also become an interprofessional training ground for future teams of nurses, physicians, pharmacists, occupational therapists, counselors and social workers.

Students get to see residents — more than 448 adults are now enrolled — within their home settings, while also having the opportunity to collaborate with licensed clinical faculty. Through a weekly on-site clinic, these teams work with residents to address their chronic health conditions, as well as offer health promotion, medication management and care coordination needs.

Over the past three years, RHWP enrollees have been more medically complex than their peers who live in the same buildings and did not enroll. Adjusted for this complexity, enrollees have had lower rates of emergency department visits and hospital admissions. Both of these benefits are indeed statistically significant for the program — and the residents.

RHWP began in 2012 with Dominion Place as its flagship site in Richmond. The program is continuously evolving as community needs are identified, adding a healthy meal program in 2016 to address food insecurity. RHWP now holds clinics in four other senior apartment buildings around the city, thanks to a growing number of partnerships, including support from the U.S. Department of Health and Human Services and several community organizations. The program is making plans to expand to another site in Richmond's East End.



450

The program has grown from 40 residents in one location to nearly 450 residents among five sites throughout Richmond.

The Richmond Health and Wellness Program delivers on-site care to residents of Dominion Place.

divergence

Prescribing opioids

Divergence from the trend

The National Institutes of Health estimates about 80 percent of heroin users started with prescription pain medication. Adam Abubaker fit the narrative. In high school, Adam had surgery for a minor shoulder injury sustained during football practice. The surgeon prescribed 90 Vicodin pills after the procedure. Adam was the son of Omar Abubaker, D.M.D., Ph.D., a professor and department chair in the VCU School of Dentistry.

Dr. Abubaker believes that physician-enabled exposure to narcotics led to his son's heroin addiction.

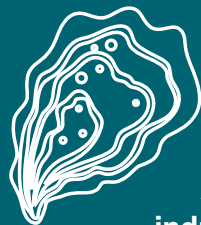
Dr. Abubaker has dedicated himself to learning about the disease that took his son's life. He has studied the biological basis of addiction and the dangers associated with overprescribing

opioids. At VCU, he instructs dentistry students on safe opioid prescribing and nursing students on how to work with patients who struggle with addiction.

Dr. Abubaker is not alone in his mission to educate students about opioids. Last fall, VCU's School of Medicine became the first allopathic medical school in Virginia to adopt the Centers for Disease Control and Prevention's new opioid prescription guidelines into its curriculum. And, physicians and educators from VCU's schools of Medicine and Dentistry collaborated on a web-based, continuing medical education course that instructs practicing physicians, nurse practitioners and physician assistants on safe opioid prescribing practices.

Students leave the program with the knowledge that chronic pain should be managed primarily with non-opioid medications, which has not been the way of thinking in recent history.





'Don't chuck that shuck'

A unique partnership among the seafood industry, nonprofits and academia is turning old oyster shells into a state treasure

State officials have added Ellery Kellum Rock, an oyster reef in Irvington, Virginia, to the Virginia Treasures list, thanks to a partnership among the Virginia Oyster Shell Recycling Program of the VCU Rice Rivers Center, W.E. Kellum Seafood and the Friends of the Rappahannock.

The one-acre reef created from oyster shells is part of a long-term effort to improve water quality in Carter's Creek and in the wider ecosystem of the creek's river, the Rappahannock. It also represents how one idea that began in 2013 with program director Todd Janeski and a few participants could spawn into a regional commitment from more than 100 supporters, businesses and restaurants — creating a profound and positive environmental and economic impact.

Today, VOSRP collects nearly 100,000 pounds of waste oyster shells from restaurants across the state in order to return the shell — with the help of nearly 150 student and community volunteers annually — to the Virginia portion of the Chesapeake Bay. In the case of Ellery Kellum Rock, the reef creates a habitat for wild oysters, which actively filter up to 50 gallons of water per day. This sanctuary allows these animals to restore their population and, at the same time, improve the water quality and ecosystem. And while these particular oysters will not be harvested, their reproduction will enhance neighboring oyster populations — a benefit to local harvesters. It's a win-win.

treasure



The VOSRP collects nearly 100,000 pounds of recycled shell annually — the equivalent of about 800,000 oysters. Once seeded with spat, approximately 15 million oysters could be planted in the Virginia portion of the Chesapeake Bay.

Members of the VCU student chapter of the Society for Ecological Restoration filling shell bags. Photo by Ronaldo Lopez.

free

to be themselves

VCU recognized as a catalyst for Virginia's LGBTQ+ youth

VCU received the 2017 Catalyst Award by Side by Side, an organization dedicated to creating supportive communities where Virginia's LGBTQ+ youth can define themselves, belong and flourish.

Side by Side specifically cited efforts such as VCU's Lavender House, an inclusive living-learning community for first-year LGBTQ+ students, and the Lavender Empowerment Summit, a weekend forum aimed at empowering LGBTQ+ students to pursue individual and community leadership roles. Side by Side also noted efforts spanning student affairs and athletics, courses offered in the Department of Gender, Sexuality and Women's Studies, and Safe Zone workshops.

The universitywide commitment to build and nourish an environment where everyone is free to be themselves spanned from academic offerings, student development, activities and student clubs to policy shifts and changes to support from the counseling center, the Title IX office and the Inclusive Excellence office.



VCU's commitment to inclusion continues to make certain that anyone who comes to VCU can flourish in every possible way because they are safe, welcome and supported.

Equality VCU is a collaborative, advisory and advocacy group, representing the LGBTQ+ community at VCU.

creative powerhouse

Business school becomes home to artist-in-residence

In a pool of more than 300 submissions spanning 33 countries, VCU's School of Business stood out for its forward-looking approach to education. It was named one of the 35 AACSB International Innovations That Inspire for 2017.

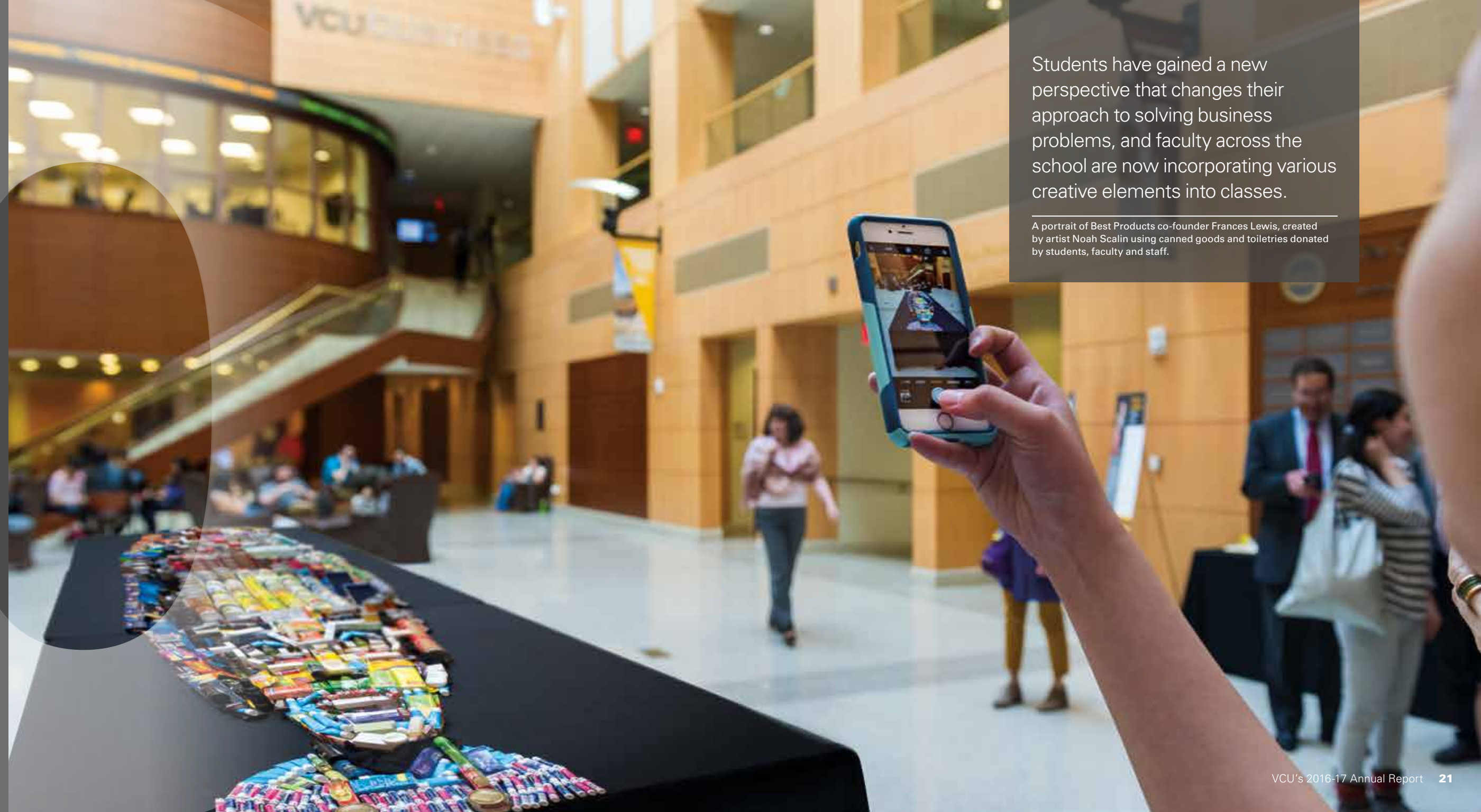
The school wanted to challenge its students and faculty to think differently. They wanted to leverage VCUarts, the nation's No.1-ranked graduate public art school. They wanted to inspire more creativity, one of the most sought-after skills for 21st-century business leaders. And they did so by instituting the country's first artist-in-residence at a business school.

Celebrated artist and innovation consultant Noah Scalin helped the school kick off its EPIC strategic plan, which aims to drive the future of business through the power of creativity. Scalin

conducted several creative-thinking seminars, served as guest lecturer in courses, created large-scale artwork installations with students and spearheaded two Creative Sprint challenges. All of this connected VCU business students, faculty, staff and the business community with the school's EPIC pillars: experiential learning, problem-solving curricula, impactful research and creative culture. The artist-in-residence program continues in 2017-18 with photographer Alyssa Salomon in the role.

Students have gained a new perspective that changes their approach to solving business problems, and faculty across the school are now incorporating various creative elements into classes.

A portrait of Best Products co-founder Frances Lewis, created by artist Noah Scalin using canned goods and toiletries donated by students, faculty and staff.



Facts & figures

The numbers tell an important story



Anchored and vibrant

From record research awards to rising graduation rates to top honors in hospital safety and quality care, **VCU is one of the nation's top urban, public research universities.** We are anchored and vibrant. And we are inextricably linked to the region we serve. Through talent, innovation, stewardship and culture, we produce a tremendous economic value and contribute in every conceivable way to the betterment and enhancement of the community. The Center for Urban and Regional Analysis in the L. Douglas Wilder School of Government and Public Affairs released a report in 2017, finding VCU's economic impact on the Richmond region and on the commonwealth of Virginia is significant.

IMPACT ON RICHMOND

\$4 billion total economic impact

47,000 jobs

For every dollar that VCU spends in the metropolitan area, the region experiences a total economic impact of \$3.70.

IMPACT ON VIRGINIA

\$5.9 billion total economic impact

63,000 jobs

For every dollar that VCU spends in the state, the commonwealth experiences a total economic impact of \$3.20.

Make it Real Campaign for VCU

VCU launched in 2016 the public phase of the \$750 million Make It Real Campaign for VCU, the largest fundraising effort in the university's history. It will touch every aspect of the university — the people, innovations and environments. It will transform VCU and help us continue to transform lives in Richmond and beyond. Since the silent phase began in 2012, the campaign has raised \$543.6 million.

\$543.6 million

Funds raised since 2012

\$78.8 million

New philanthropic commitments, 2016-17

About VCU

STUDENTS

31,231 students enrolled

85% Virginia residents

82% full time

41% minority and

27% underrepresented minority students

25% enrolled in STEM programs

62.4% 6-year graduation rate

86.4% first-year retention rate

7,728 degrees and certificates awarded

5,207 baccalaureate

1,455 master's

306 doctorate

437 first-professional

138 undergraduate post-baccalaureate certificate

165 graduate post-baccalaureate certificate

20 graduate post-master's certificate

11 Fulbright student scholars

VCU named a top producer of Fulbright student scholars for 2016-17, according to the U.S. Department of State's Bureau of Educational and Cultural Affairs

ALUMNI

188,745 total living alumni

83% of alumni employed or enrolled in graduate school in Virginia

FACULTY

2,274 teaching and research faculty

234 term and tenure-eligible faculty hired

22% of T&R faculty are minority

COMMUNITY ENGAGEMENT AND SERVICE LEARNING

1,315,086 hours served by students

12,022 students engaged in service

3,635 students enrolled in service-learning

251 service-learning class sections

132 faculty taught service-learning courses

RESEARCH AND INNOVATION

\$275 million total sponsored awards

\$157 million total federally funded grants

134 invention disclosures

165 patents filed

22 patents issued

2 copyrights

18 licenses/options

34 research support agreements

FINANCIALS

Total for VCU, VCU Health System and affiliated foundations:

\$3,787.7 million revenues and capital additions

\$3,649.3 million expenditures

top 100
research university according to
the National Science Foundation

Bright future

Our unyielding focus allows us to reimagine the 21st-century university. Our future is bright as we welcome new leadership, create new environments for new experiences and embark on new initiatives that embody our values and move our mission forward.



Gladding
Residence
Center
architectural
drawing

NEW LEADERSHIP



SHAWN BRIXEY was named dean of the School of the Arts and provides leadership in education, research, community outreach and fund development activities. Brixey previously served as dean of the School of the Arts, Media, Performance and Design at York University in Toronto.



PETER F. BUCKLEY, M.D., now leads the VCU School of Medicine as dean and serves as VCU Health System's executive vice president for medical affairs, overseeing the 600 physician-faculty group practices of the academic health sciences center. Buckley came to VCU from Augusta University in Georgia where he was dean of the Medical College of Georgia and executive vice president for medical affairs and integration.



JAY DAVENPORT joined the VCU community as the university's vice president for development and alumni relations. Davenport previously served as associate vice president of individual giving and campaign management at Wake Forest University.



MONTSERRAT FUENTES, PH.D., joined the VCU team of deans to lead the College of Humanities and Sciences. Fuentes previously served as the head of the Department of Statistics and James M. Goodnight Distinguished Professor of Statistics at North Carolina State University.



MIKE RHOADES joined the Rams to lead the men's basketball team as head coach. Rhoades spent the past three seasons as the head coach at Rice University, where he was credited with a highly successful turnaround job that culminated in the second-most wins in a season in Rice University's history.

FACILITIES ON THE HORIZON

VCU and VCU Health have both embarked on master site plans that will reinforce the concept of one VCU by providing a cohesive blueprint for the future development of the Monroe Park and MCV campuses. Here are just a few updates of recent capital construction projects.

- **GLADDING RESIDENCE CENTER** is a \$96 million project that will create a 12-story, 360,000-square-foot residence center to house 1,524 students. It is slated to open at the beginning of the 2018 academic year.
- **VCU POLICE HEADQUARTERS** relocated to be equidistant from the university's two Richmond campuses. The renovated building provides more work and training space for staff, better technology and centralized emergency operations space for Virginia's largest campus law enforcement agency.
- **ALLIED HEALTH PROFESSIONS BUILDING** broke ground in spring 2017 and will bring all 11 of the school's units into one 154,000-square-foot building, scheduled to open fall 2019.
- **INSTITUTE FOR CONTEMPORARY ART** will open in spring 2018 with nearly 41,000 square feet of flexible space and will feature a dynamic slate of changing exhibitions, performances, films and interdisciplinary programs.

INITIATIVES UNDERWAY

Planning is underway for **VCU'S NEW STRATEGIC PLAN**. Scheduled to be implemented in fall 2018, the new plan will build off the success of the current Quest for Distinction, which has been in place since 2011. Early themes have emerged out of universitywide conversations, focused on VCU's national prominence, local impact, student success, diversity and inclusion, and enhancing the university's work culture.

In 2017, VCU approved its five-year **DIVERSITY AND INCLUSION STRATEGIC ACTION PLAN**, an outgrowth of the president's strategic diversity actions, and the university's core value and commitment to create a diverse, equitable and inclusive environment. This plan provides overarching



Building the Institute for Contemporary Art

institutional guidance for VCU's focused work on strategic priorities. The plan is organized around four themes — institutional commitment; climate and intergroup relations; recruitment, retention and success; and education, scholarship and research — connected by an extensive assessment plan. The plan and report were informed by universitywide diversity and inclusion input sessions and information shared by VCU faculty, staff, students, alumni and other constituent groups.

Also in 2017, VCU launched the **CENTER FOR URBAN COMMUNITIES**, the university's hub for community engagement to connect, coordinate and align VCU and VCU Health's teaching, research and clinical resources more intentionally on a few key community-identified city and regional issues. The center's first initiative — a health and wellness center adjacent to a new grocery store — is a collaborative VCU and VCU Health effort to improve the overall health and economic vitality of the community living in Richmond's East End.



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