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TWO WHEELS INSTEAD OF FOUR: Rice sociologist Michael Emerson has traded in his car for a bike after spending a year in Denmark, where he conducted a comparative survey between Copenhagen and Houston.

Inside:



A BRIDGE TO THE TEACHING COMMUNITY: The Rice University School Mathematics Project is on a mission to help local teachers and administrators better understand the nature of mathematics. See Page 7.

A Contrasting Tale of Two Cities

Rice sociologist Michael Emerson went to Copenhagen, Denmark, to learn more about the city, but in the process learned something about himself. He discovered he could live without a car in Houston.

When he returned this summer from his yearlong sabbatical, he did something that a lot of people in Houston would consider sacrilege: he gave his car to his son in Minnesota and bought two bikes; one to get to the bus stop and another to use on the Rice campus.

Emerson, academic director of the Kinder Institute and the Allyn and Gladys Cline Professor of Sociology, experienced his transformation after living in a city in which almost everyone rides a bike and uses public transportation.

“They ride bikes year-round, right through the winter,” Emerson said. “It doesn’t matter what is happening,

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Rowing It Forward

Rice University students built a unique wheelchair for a Houston teenager, who will now be able to row his way forward.

Pedro, 15, a patient at Shriners Hospital for Children, Houston, has had arthrogryposis since birth. This congenital disorder causes severe limitation of movement in all of his joints. But Pedro’s path has been made easier by a group of Rice students who took four years in designing and creating a wheelchair that works with a paddling motion and does not require Pedro to turn the wheels of his manual wheelchair by hand.

Pedro’s disability prevents him from pulling his arms in at the elbows, though he can push out. His wrists are also locked in a rotated position.

“He can’t operate a normal wheelchair because it would require him to grip the wheels, which he can’t do,”

Continued on Page 3 >>

they ride their bikes.”

Emerson went to Denmark to conduct a comparative survey between Copenhagen and Houston. “We picked Copenhagen because we wanted a city that is diametrically different from Houston, but has similar levels of wealth, political power and human capital,” Emerson explained. “It’s important to study cities, because that’s where most of the human beings will settle. Everyday millions are migrating to cities, and over half of the earth’s population already live in an urban area. Cities are our present and our future.”

Conducted during April 2014, the survey was created in part by students from a class that Emerson was teaching in Copenhagen. The survey contained 150 questions about the city’s economy, population, life experience, beliefs and attitudes. The response rate was an astounding 77 percent — unheard of in the United States. According to Emerson, the response was high because the survey was conducted online, which was easy to complete,

and they fear crime a lot more.”

In fact, according to the survey, only 18 percent of the people in Copenhagen fear that they will be victims of a crime compared with 60 percent in Houston. This lack of fear of crime in Copenhagen, Emerson said, is related to the high level of trust that people have for each other.

As a parent of two teenage daughters, this was a major relief for Emerson. He said that when his daughters went out at night to visit friends on the other side of town, he never once worried that something would happen to them. “I would never do that in Houston,” he said. He also said that he never had to figure out how to get his daughters to a certain place because they could either walk, bike or take the train.

How people transport themselves was another key finding. In Houston, 92 percent use a car. In Copenhagen, almost the opposite occurs: 91 percent do not use a vehicle; rather they either ride a bike or employ pub-

using alternative forms of transportation. In Copenhagen, Emerson added, the city was planned so that nobody lives more than a 15-minute walk from public transportation, thus making it easier to maneuver through the city without a car.

When it came to finding a job, Houston fared better. In Houston, 63 percent of the people said they felt that job opportunities are excellent or good; in Copenhagen, 53 percent shared this sentiment.

“People in Houston love Houston because the city offers many opportunities to make a good living. It’s a market-based city and almost every issue in the city is based on how will it make us more economically competitive,” Emerson said.

In Copenhagen, the exact opposite is true. Decisions are based on improving the quality of life, caring for the environment and creating equality between the people. “They base their decision on whether it will make the city better for future generations,” Emerson said.



A STUDY IN CONTRASTS: Copenhagen is diametrically different from Houston, according to a survey conducted by the Kinder Institute.

and the questions dealt with issues that resonated with the residents.

A major finding is the level of trust people have for each other. In Copenhagen, 81 percent of the respondents said that “most people can be trusted,” whereas in Houston only 33 percent agreed with that statement. Emerson explained that Copenhagen is ranked as one of the least corrupt cities in the world. It’s a communal-based city and people are used to working together. “They frown upon anyone separating from the group,” Emerson said.

“One thing that became evident to me after living there for awhile is that when you have a society in which members trust each other, a lot more can get done in the city,” Emerson said. In cities where the level of trust is low, it is more difficult for people to cooperate on a project that is for the greater good of the com-

munal transportation. “People ride bikes in suits, in dresses, in whatever they are wearing,” he said. “Every place of employment is required to have a shower for its employees to clean up, if they wish, after a strenuous bike ride or walk.”

When asked what they viewed as the biggest problem facing their city, residents from both Houston and Copenhagen pointed to traffic as their main concern. But what is interesting is that traffic problems meant different things in the two cities. For Houston, a city that is almost impossible to get around without a car, traffic meant the roads were not big enough to accommodate the sea of cars.

For Copenhagen, traffic meant quite the opposite. The survey indicated too many cars are polluting the city and causing a lower quality of life and not enough people are

using alternative forms of transportation. “It’s fascinating how the city planners have created a city that celebrates the joie de vivre [carefree enjoyment of life]. The city is pulsating with life, there’s an endless heartbeat as people are always outdoors enjoying cultural activities.”

For Emerson, his experience in Copenhagen is one he will cherish forever. He brought back a bit of the city’s spirit as he ditched his car for a bike and public transportation. “It’s amazing how much stress disappears from your life when you don’t have a car,” he said. “It’s also cheaper. You don’t have car payments, car repairs, no speeding tickets, no insurance and no gas to pay for.”

DAVID D. MEDINA

Director

Multicultural Community Relations

Public Affairs

said Michaela Dimoff, a Rice junior and bioengineering major, and part of the Wheelin' and Dealin' wheelchair team that designed the new device.

The new chair has push-forward paddles instead of armrests. Pedro places his hands inside fabric loops and pushes to move. The spring-loaded arms do the work when it's time to pull his arms back to complete the cycle.

Pedro has a motorized wheelchair he uses at school, but at home, when his family is not available to push him in a standard chair, he's wheel-less. "He moves around his house by commando crawling with his forearms," Dimoff said.

The chair was built at Rice's Oshman Engineering Design Kitchen (OEDK) by a team that includes mechanical engineering majors Jared Elinger and Christina Petlowany and materials science and nanoengineering major David Smith, all juniors, and senior art history major Reed Thornburg. The parts were fabricated and assembled there with the exception of hub-mounted transmissions on each wheel that allow Pedro to go forward and backward and also give him a neutral gear.

Weeks after taking on the project, the team had its first meeting with Pedro to get specifics on his physical capabilities. "We spent a long time trying to figure out the scope of what he can do," Elinger said. "It quickly became clear that for propulsion, a rowing motion was our only option."

"For our initial prototypes, we used bicycle hubs," Petlowany said. "Once that didn't seem to work so well, we moved to bicycle hubs and chains. And we could make it work, but it didn't meet our design criteria and clearly wasn't a long-term solution."

"Our industry mentor, Scott Daigle, the co-founder and CEO of Intelliwheels in Illinois, told us it would take hundreds of thousand of dollars and years to be able to machine our own gears and get them to work," Dimoff said.

"We didn't want Pedro to have to wait that long," Petlowany added.

The students found their solution at a California-based company, Innovations Health, which sold them wheelchair-specific, lever-operated Wijit wheels at wholesale and advised the students on how to incorporate them into their existing design. The teammates raised funds to buy them, with significant contributions coming from OEDK, the Rice Center for Engineering Leadership and the Shriners International chapter in Houston.

Pedro's input was critical at every step, Smith said. "We tested the chair with him six or eight times.

The team also called upon experts to help refine the wheelchair, which was turned over to Pedro for extended beta testing in August. Phil Kortum, a Rice assistant professor of psychology and a human factors specialist; Alan Russell, the director of Rice Disability Support Services;



A FORWARD-MINDED TEAM: Thanks to a group of Rice students who designed a unique wheelchair, a Houston teenager will be able to move with greater ease.

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"Dr. Saterbak told us, 'You guys are it. You're the last hope.' So there was no excuse. It didn't matter what we had to learn or what we had to do, or how long it took because this boy needed a wheelchair, and we couldn't let him down."
|.....

—**Michaela Dimoff**

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and Lex Frieden, a disability policy expert and rights activist, offered valuable advice during visits to the OEDK. Dimoff said the students didn't know until later that Frieden is a chief architect of the Americans With Disabilities Act.
|.....

The project began as one of the first offered by faculty adviser Ann Saterbak, a professor of bioengineering education and associate dean for undergraduate education, when she started her freshman design course four years ago. Other teams had tried and failed, she said.

"Dr. Saterbak told us, 'You guys are it. You're the last hope,'" Dimoff said. "So there was no excuse. It didn't matter what we had to learn or what we had to do, or how long it took because this boy needed a wheelchair, and we couldn't let him down."

MIKE WILLIAMS

Senior Media Relations Specialist
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Teacher Education Celebrates 50 Years

In September, the Teacher Education program at Rice University celebrated 50 years of providing teacher preparation.

Founded in 1964, the program was established on the tenets of creating content experts who were adept at writing and delivering innovative curriculum. Today the Teacher Education program has expanded and now offers multiple academic programs to prepare and advance Houston area teachers: Teacher Certification for Rice Undergraduates, Undergraduate Five-year Master of Arts in Teaching, Master of Arts in Teaching for New Teachers and Master of Arts in Teaching for Experienced Teachers.

To kick-off the anniversary event, Angela Valenzuela, director of the University of Texas Center for Education Policy and professor in the Educational Policy and Planning Program at the University of Texas at Austin, presented a lecture on “Educational Equity, Politics and Policy in Texas.”

The event was held Sept. 3 in the Hudspeth Auditorium at the D. Kent and Linda C. Anderson and Robert L. and Jean T. Clarke Center, the new home of the Susanne M. Glasscock School of Continuing Studies. More than 80 people attended. After the lecture, Valenzuela engaged in a dynamic question and answer session.

The following evening, guests gathered in the Grand Hall of the Rice Memorial Center to commemorate the anniversary and attend a panel discussion, “Education for Equity in Texas Schools.” The panel was composed of Valenzuela; Juliet Stipeche ’96, president of the HISD board and associate director of the Center for Excellence and Equity at Rice University; Alex Byrd ’90, associate professor of history at Rice; Linda McNeil, director for the Center for Education at Rice; Neil Lane, senior fellow in science and technology policy at Rice; and Grace Magnani, the 2014 Fort Bend ISD Rookie of the Year. The panel was moderated by Judy Radigan, director of the Teacher Education program. The audience enthusiastically applauded the speakers who expressed their views passionately on the state of affairs in education.

As the program looks forward to the next 50 years, Teacher Education continues to embrace its role in stimulating and sustaining Houston’s teachers with a focus on assisting educators in furthering their education, professional growth and career goals for many more decades. Teacher Education will continue to provide professional education courses that include extensive study of critical issues in education and effective pedagogy for diverse learners.

LAURA BAILEY

Marketing Coordinator

Susanne M. Glasscock School of Continuing Studies

R-STEM Reaches Out

The Rice Office of STEM Engagement (R-STEM) is stretching its outreach to the other side of the world.

Previously known as School Science and Technology, R-STEM has long been active in the community by providing exemplary instruction in science, technology, engineering and mathematics to local students. But this summer, the office expanded its mission globally, bringing its signature inquiry instruction to enthusiastic teachers in Tanzania and Mozambique. This international collaboration is part of a new partnership with Schlumberger to create the Schlumberger STEM Teacher Academy (SSTA). The new academy provides secondary school science teachers in developing nations with rigorous professional development in both content and inquiry teaching pedagogies to help produce a thriving STEM workforce.

The program kicked off with a one-week workshop for 50 middle- and high-school science teachers in Mtwara, Tanzania in July. R-STEM and Schlumberger staff led participants in inquiry-driven physics, chemistry and biology lessons, giving teachers the opportunity to experience this style of learning firsthand. Most of the teachers at the weeklong academy were accustomed to giving students information on the board while students sat quietly and took notes. Allowing the teachers to participate in cooperative explorations and discussions instead helped teachers see how inquiry pedagogies could help improve the engagement and understanding of their students.

However, the reliance of Tanzanian teachers on traditional, teacher-centered approaches is partly driven by the significant lack of teaching supplies in the country. Incorporating technology into instruction is particularly challenging. Not only have many teachers in Tanzania never owned a computer or used one in the classroom, but many would be grateful simply for the guarantee of electricity on a regular basis. In fact, power was lost during the workshop itself on multiple occasions.

Recognizing this as a significant barrier to the improvement of STEM teaching in these developing countries, SSTA provided participants with all the materials needed in order for teachers to lead the activities they learned in the workshop in their own classrooms, including lab equipment, chemicals, microscopes, laptops, hand-held projectors and chargers capable of using solar-power when electricity is unreliable. The workshop also focused on leveraging locally available resources in inquiry instruction. For example, participants investigated changes in homeostasis by simply using salt, sugar and water. In another experiment, bananas from a participant’s house were used to extract DNA.

The academy expanded to neighboring Pemba, Mozambique, in August. Eager to support the program, representatives from the Ministry of Education and the Provincial Directorate of Education and Culture welcomed the group. While teachers in Mozambique experience many of the same challenges with regards to materials and technology that their Tanzanian neighbors do, they are also faced with very large class sizes. As a result, instruction focused on how to use strategies that incorporate cooperative learning elements into even large classroom settings, such as Think-Pair-Share. As one participant said, the training “was like nothing we have ever seen.” R-STEM and the SSTA team will return to both countries this winter to offer follow-up training and assess the impact of the program.

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Assistant Director for Biology and Life Sciences

GIGI NEVILS-NOE

Assistant Director

AMBER SZYMCZYK

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Office of STEM Engagement

Rice Village Reimagined

This fall, the Rice Design Alliance held an intensive design competition, or a charette, to reimagine Rice Village. Sixteen teams comprising Houston-based architects, designers, urban planners, engineers and more met in August at Rice University.

Around 9 a.m., as the teams unloaded their laptops, printers and other materials and set up at tables throughout the commons, event chairperson Emily Winters of Kirksey Architecture announced the program.

She told the teams that they should focus on improving Rice Village in three ways: circulation, parking and identity. Specifically, Winters explained, teams should design safe, equal access for pedestrians of all ages and abilities. They should incorporate multiple modes of transportation, allowing for biking, walking, driving and taking public transit. And teams should create a cohesive identity and brand for the Village, incorporating wayfinding signage and parking solutions and improving the overall experience through landscaping and placemaking.

The teams worked all day, stopping only for lunch. Some took to their laptops to create photographic collages and digital renderings of

new amenities; others worked to hand-draw sketches.

Two days later, the teams' final designs were displayed on boards in the Jury Room at Anderson Hall on the Rice campus. About 100 people, including city administrators and residents from the neighborhoods around campus, attended the reception. Winners were announced by a jury comprising Kathie Easterly, University Place Association executive director; Neyran Turan, Rice School of Architecture assistant professor; and Andrew Albers, vice president of the Office of James Burnett.

The jurors recognized Rachel Gonzales, Donald Hickey, Shane Wilson and Cameron Goldsmith for "Most Visionary" design, which centered on an iconic 10-story parking tower.

First place went to a team from Page comprised of Özge Gulec Inal, Noe Ramirez, Geri Powell, Lawrence Stewart and Verrick Walker. Second place went to a team from PGAL comprised of Alec Luong, Emily Luong, Ryan Horton, James Anderson and Jon Hale. And third place went to Iona Bruckner, Suzan Ozcelik, Andrea Gonzales and Alexander Hohman.

ALLYN WEST

Assistant Director of Communications
Rice Design Alliance



A NEW VISION FOR THE VILLAGE: Teams of Houston architects, designers, urban planners and engineers participated in a design competition to improve the circulation, parking and identity of the Rice Village.

Fulfilling a Vision

In our founding president, Edgar Odell Lovett's vision for Rice, as well as President David Leebron's Vision for the Second Century, there is a distinct call for Rice to be a university engaged with its city by providing high-quality educational opportunities. Since 1994, the Glasscock School of Continuing Studies has helped fulfill these visions in part through the Center for College Readiness (CCR).

Through its first formal offering, the Glasscock School began its teacher professional development program by providing summer training for Advanced Placement (AP) and Pre-AP teachers. Over time, program offerings diversified and the impact at the local, state, national and international level dramatically grew. In 2011, the program took on the mantle of the CCR to more accurately describe the breadth of its work, and now the CCR provides opportunities for teachers, administrators, counselors and students to deepen their knowledge of academic content and increase their awareness of the importance of college-readiness skills. Programs are designed with the goal of ensuring that students are academically prepared for the rigors of college and can successfully navigate their pathway to postsecondary success.

To date, the CCR, has trained more than 50,000 educators and students from all 50 states and 53 countries through a variety of programming that includes professional development for AP, International Baccalaureate, middle school, writing, technology, college readiness and student programs. The U.S. Department of Education, the National Science Foundation, the Arthur Vining Davis Foundation and the Freeman Foundation, among others, have provided funding for these award-winning programs.

In 2014, by marking the 20th anniversary of its flagship program, the AP Summer Institute, the department celebrated 20 years in service to the K-12 community and is looking forward to a future of continued growth, engagement and enrichment.

To learn more about the CCR, visit collegeready.rice.edu.

BRET NEWCOMB

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Initiative Assists High School Students

Since 2008, the Center for Engaged Research and Collaborative Learning (CERCL) at Rice University has spearheaded a high school outreach initiative aimed at providing academic and financial assistance for high school students in Houston's underserved communities.

One part of this outreach program is an annual high school essay contest held in the spring. Sophomores and juniors who demonstrate academic excellence are invited to participate. The contest provides a question meant to lead students to think critically about an issue affecting their community and to respond in a clear, creative and compelling fashion. The first-, second- and third-place winners of the contest receive scholarship money.

In addition, CERCL gives the top 10 essay writers a free Princeton Review SAT prep course. CERCL also invites all participants to an all-day summer writing workshop in which undergraduate tutors from Rice's Center for Written, Oral and Visual Communication provide valuable strategies for writing strong, clear and creative college-level essays. Workshop participants also have the opportunity to inquire about the admissions process at Rice by talking to a representative from the admissions office.



With more than 200 students from 10 different HISD schools participating, the 2014 High School Essay contest was a great success. Elliot Ross from Reagan High School won first place and a \$1,000 scholarship; Natalie Sanchez from Chavez High School was second, receiving \$750; and Dajah Cade from Jack Yates High School came in third, winning \$500. In addition to the winners, the 10 students who participated in the Princeton Review SAT prep course reported a 225 point average increase in their scores, and the participants at the writing workshop this year received valuable information that will help them prepare for college.

CERCL's engagement with high school essay contest participants does not stop after the writing workshop. The center stays in contact throughout the year with faculty and staff from partnering HISD schools, providing various forms of support and resource for students. One such resource is online tutoring through the Rice student club ACE@Rice (Academic and Cultural Empowerment). CERCL remains committed to strengthening the ties between Rice and the Houston communities by providing valuable resources that will help local students pursue their educational and professional aspirations. For more information, visit cercl.rice.edu.

BIKO M. GRAY

Graduate Student
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A Math Bridge

The Rice University School Mathematics Project (RUSMP) was established in 1987 to provide a bridge between the Rice mathematics research community and Houston-area mathematics teachers.

The mission of RUSMP is to help teachers and administrators better understand the nature of mathematics, the effective teaching and assessing of mathematics, and the importance of mathematics in today's society.

A school that RUSMP is supporting this academic year is Woodson Leadership Academy in the Houston Independent School District (HISD). Located in the Sunnyside neighborhood of Houston, this inner-city school has an enrollment of about 900 prekindergarten to eighth-grade students. Woodson has been featured by HISD as an example of a school involving the whole family to ensure student success.

RUSMP is helping Woodson teachers in this endeavor by providing mathematics professional development, coaching and mentoring for mathematics teachers at all grade levels. RUSMP activities are designed to support the development of teachers' professionalism by focusing on three major areas: a solid knowledge of mathematics, including key concepts that students must master; awareness of a variety of approaches to instruction and their appropriate use; and the ability to plan and reflect collaboratively on instruction with other teachers.

One of Woodson's mathematics teachers said that she is becoming a more effective teacher thanks to RUSMP, which enhances understanding of the new mathematics curriculum standards for Texas.

Through RUSMP's coaching and mentoring, Woodson's teachers are incorporating teaching strategies such as Robert Marzano's nine highly effective research-based instructional strategies, which include: identifying similarities and differences; summarizing and note-taking; reinforcing effort and recognition; assigning homework and practice; using nonlinguistic representations; implementing cooperative learning; setting objectives and providing feedback; generating and testing hypothesis; and creating cues, questions and advanced organizers.

In the professional development training, teachers focus on creating questioning strategies based on Bloom's Revised Taxonomy for Mathematics, which indicate different levels of student thinking. These strategies are used by teachers to diagnose students' strengths and weaknesses and build students' capacity to solve and discuss complex mathematics problems.

RUSMP also is working with the instructional leaders at Woodson to implement an effective mathematics program and sustain instructional change. RUSMP is offering evening classes in algebraic reasoning to a team of instructional leaders and mathematics teachers from Woodson.

The collaboration between Woodson's mathematics teachers and instructional leaders and RUSMP has created a network of support wherein the mathematical and pedagogical content knowledge of teachers is enhanced.

SUSAN TROUTMAN

Director for Secondary Programs
Rice University School Mathematics Project

CAROLYN L. WHITE

Director for Elementary Programs
Rice University School Mathematics Project

Prospective Students Experience Rice

Each year, the Office of Admission hosts two signature campus-visit programs designed especially for prospective undergraduate students who are academically talented and ethnically diverse.

The programs, Seeking Opportunities at Rice (SOAR) and VISION, are invitation-only programs. SOAR takes place in late September and recruits prospective students to become applicants. VISION occurs in mid-February and provides applicants an in-depth view of the Rice experience. These are great opportunities for students to gain insight into Rice by staying overnight on campus with current undergraduates, attending classes, and meeting with professors and alumni.



MORE THAN JUST A VISIT: Two programs offer prospective students an opportunity to learn what makes Rice so special.

"These events are crucial to the success of recruiting students who are highly sought after by many selective colleges and universities. With both SOAR and VISION, the Office of Admission covers the students' travel costs to campus because we are confident that a campus visit will move Rice up on the list of their top choices for college," said Tamara Siler '87, senior associate director of admission and coordinator of minority recruitment.

While the Office of Admission selects the participants, sponsors travel costs and organizes these programs, Siler emphasized that SOAR and VISION would not be possible if not for the efforts of Rice students, faculty, staff and alumni.

"We rely heavily on campuswide participation in SOAR and VISION," Siler said. "We have dedicated faculty and staff whom we can count on each year to join us in these events, and I always hope to see more. So don't be shy when we invite you to an event. Meeting and talking with students, faculty and staff is the prospective students' incentive to accept our invitation."

VISION is scheduled for Feb. 15-17, 2015. Siler said they will host approximately 200 students. Any member of the Rice community who is interested in participating in VISION is encouraged to contact the Office of Admission for more information.

"There is nothing more rewarding than meeting a student in the early stages of their college search and when they choose Rice knowing you played an important role in that decision," Siler said. "SOAR and VISION are the perfect opportunities to directly impact the growth and diversity of the Rice Owl family."

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AT LARGE



INSIDE THIS ISSUE: The Teacher Education program, which has expanded over the years, celebrated its 50th anniversary with a dynamic lecture, an engaging panel discussion and a lively reception. See Page 4.

David D. Medina, Director, Multicultural Community Relations, Office of Public Affairs

