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USC ROSSIER SCHOOL *of* EDUCATION | ISSUE 3 | May 2011

rossier research

[CENTER FOR COGNITIVE TECHNOLOGY]

capturing expertise
TO TEACH SURGEONS

COLLABORATION BETWEEN USC ROSSIER SCHOOL OF EDUCATION and the Keck School of Medicine began a decade ago with a collaborative teaching experiment designed by Rossier faculty member **Dr. Richard Clark** and **Fredric Maupin**, an Ed.D. student. They examined the benefits of using a version of Cognitive Task Analysis (CTA) developed by Clark to capture the implicit knowledge and skills experts use to perform complex surgical procedures. In an experiment that captured a routine but difficult trauma procedure, results demonstrated that when instruction is based on CTA, students learn about 30% more, in significantly less time, and make many fewer serious mistakes than with traditional pedagogy. Encouraged by the results, Clark and **Dr. Kenneth Yates** at the Rossier Center for Cognitive Technology (CCT) and **Dr. Maura Sullivan**, Executive Director of the Surgical Skills Simulation & Education Center in the Department of Surgery at Keck, have recently collaborated on a number of CTA studies involving a variety of surgical procedures.

This interdisciplinary line of research stems from the challenges healthcare providers in the United States face that underscore the need for highly-trained surgeons and other medical staff who must operate in high-stakes, time-pressured environments. As an additional challenge, recent research in cognitive science and its application to the teaching of complex knowledge has revealed that experts who develop curricula and teach may unintentionally leave out about 70% of the information students need to learn and perform successfully. This omission forces students to 'fill in the blanks' by trial-and-error learning. The reason that experts only provide about 30% of the information students need to succeed at tasks is that the knowledge they've gained through long experience is largely automated and non-conscious.

Cognitive Task Analysis is a multi-stage interview technique that captures the automated and non-conscious knowledge acquired by experts through experience by using multiple subject matter experts to describe the same procedure, followed by cycles of expert and peer-review.

The interdisciplinary research among colleagues in the Rossier and Keck schools has focused on two surgical training areas. First, CCT and Keck researchers wanted to quantify the critical information surgeons may omit as they provide unaided descriptions of how to perform a procedure compared with the knowledge gained from a CTA interview.

The second area of interest to the Rossier and Keck researchers has been to demonstrate the increased effectiveness of surgical training when the results of CTA are included in the curriculum. Additional studies in the past three years with different surgical procedures have demonstrated from 20% to 130% improvement in the performance of medical students with CTA.

By continuing their collaboration on future studies, Rossier and Keck researchers hope to make significant research contributions that will have an enduring impact on surgical training and, more generally, education in the professions. ■

[FROM THE DEAN]

At the USC Rossier School of Education, interdisciplinary research is being actively conducted by faculty throughout the school—tenure/tenure-track, clinical and research faculty. In recent years, Rossier has intentionally reached out to our university colleagues to substantially increase the number of faculty with joint or courtesy appointments. In fact, the number of faculty members with a primary appointment in another school and a joint or courtesy appointment at Rossier rose more than 50 percent between 2006 and 2011.

This issue of *Rossier Reach* features the work of several of these collaborative teams. As USC Provost Elizabeth Garrett stated in her installation address in January 2011, "The strength of a research university is the proximity of those who study in many disciplines." It is through the bringing together of many minds that Rossier research can have the most profound impact and the greatest reach.

Karen Symms Gallagher, Ph.D.
Emery Stoops and
Joyce King Stoops Dean

RESEARCH beyond BOUNDARIES

THE INTERDISCIPLINARY RESEARCH featured in this issue of *Reach* is working to positively impact a number of critical topics at the forefront of the American consciousness.

In 2011, the number of families dealing with Autism Spectrum Disorder has increased substantially and Rossier's Center for Outcomes Research and Evaluation (CORE) is at work with the Keck School of Medicine, Annenberg School for Communication & Journalism, and the School of Cinematic Arts to find breakthrough interventions and treatments for those with this perplexing diagnosis. CORE, which is led by **Dr. Gisele Ragusa**, is also involved with the Viterbi School of Engineering and other disciplines across the university in research ranging from building STEM capacity for both students and teachers, to empowering urban teens through health awareness.

Currently, First Lady Michelle Obama and Dr. Jill Biden, wife of the Vice President, are leading a national campaign to support American military families. The work of **Dr. Ron Avi Astor**, through Rossier and the School of Social Work, has been out ahead of this effort with a federally funded study of the impact of deployed parents on K-12 students. This timely research involves several schools and district administrators in San Diego, California, which boasts a high concentration of military families.

Reach also profiles Rossier's Center for Cognitive Technology (CCT), where **Dr. Richard Clark**, **Dr. Kenneth Yates**, and **Dr. Maura Sullivan** have teamed up with the Keck School of Medicine to solve such problems as how to teach medical students the complex intricacies of surgery. In the meantime, Rossier is also involved with five different schools in a project led by **Dr. Henry Jenkins** called the USC Serious Games Initiative.

These are just a few examples of how Rossier researchers collaborate across many disciplines. The University of Southern California has a history of fostering interdisciplinary research, and its promotion is a key component of the USC Strategic Plan, which notes that this kind of work "begins with faculty and students posing research questions that cannot be answered within a single traditional discipline." USC and the Rossier School are strengthening the culture, infrastructure and philanthropy to support further interdisciplinary creativity and collaboration. ■

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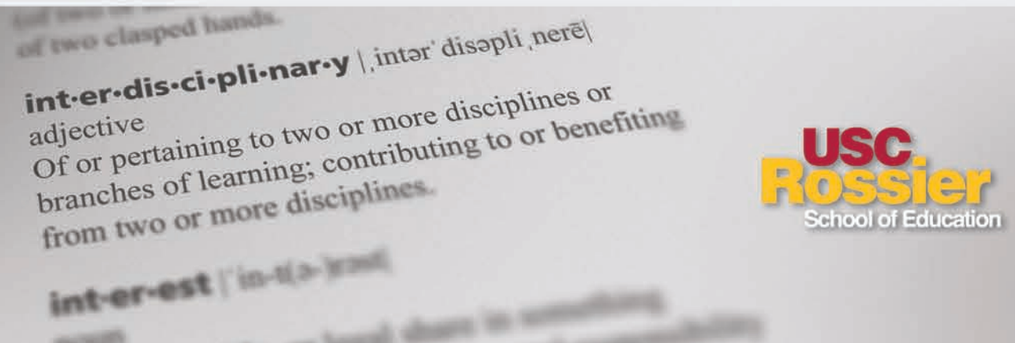

building bridges

BETWEEN RESEARCH AND PRACTICE IN AUTISM SPECTRUM DISORDER

IDENTIFICATION OF AUTISM IS ON THE RISE, and there is much debate about the causes and treatment effectiveness of contemporary and historically-focused therapies. A team of USC researchers will design, implement and conduct research on an innovative educational toolkit that provides information on cutting edge research and interventions for children and adults with autism spectrum disorder (ASD).

The collaborative research team from USC's School of Cinematic Arts, Annenberg School for Communication & Journalism, Rossier School of Education, and Keck School of Medicine is working on an interactive media tool that can be used to provide training, information and resources about ASD for diverse practitioners including physicians, teachers, therapists, and families. Principal Investigator **Dr. Mark Harris** and Co-Investigators **Dr. Gisele Ragusa**, **Dr. Marsha Kinder**, and **Dr. Michael Cody** have teamed up with national experts on autism spectrum disorders, as well as practitioners, parents, and teachers from across the country, to engage in this compelling, interdisciplinary, large-scale research endeavor. It is through its interdisciplinary nature that the team is able to engage in clinical translation of research to practice using innovative technological foci combined with high-quality content with important societal relevance.

The project is in its first year of operation, and has received funding from the Department of Health and Human Services' Center for Outcomes and Evidence of the Agency for Healthcare Research and Quality (AHRQ) to produce and quantitatively test and evaluate the impact of innovative adaptations of comparative effectiveness research (CER) products and disseminate them to the described diverse audiences. Once the product, which is considered a kit of research "interventions," is developed, the research team will use "stealth" assessment procedures to assess its components' efficacy and impacts on the populations with which it will be utilized. A randomized controlled trial will be conducted with approximately 15,350 diverse participants to test the diverse components of the multimedia toolkit. This multimedia toolkit will be interactive, and will include video footage of cutting-edge research on ASD, contemporary media-based examples of treatment options, videos of interviews with researchers, practitioners, families and individuals with autism, in addition to helpful information about research on ASD.

Research indicates that the incidence of ASD may be as common as 1 in 100, with males affected four times as often as females. Symptoms persist throughout life, disrupt families and lead to significant disability, such that ASD is a major public health problem that costs society upwards of $35 billion in medical/nonmedical costs. Use of psychoactive medication has made a significant contribution to the clinical care of children and adolescents with ASD. Three large-scale randomized trials have been completed; two of these trials examined the efficacy and safety of the antipsychotic medication, risperidone. Psychosocial interventions utilized in ASD are based on the theory and practice of applied behavior analysis and developmental science. Discrete trial training, based on operant discrimination learning, is the earliest form of this intervention for children with ASD. While efficacious, this training is expensive and may lack the flexibility needed for application in schools with more limited resources. Researchers have remedied some of its limitations by developing less structured, more naturalistic programming for individual and group settings.

There is a critical need for more accurate and wider dissemination of information on these and other ASD treatments. The void has been filled by intense media attention on unfounded theories of causation and corollary treatments; consequently, considerable misinformation has been disseminated. In order to correct these misperceptions and increase the impact and effective use of AHRQ CER products in our multimedia kit, the research team will target audiences, stakeholders, systems and settings not already specifically targeted or reached that are significantly important for individuals with ASD.

The innovation of this multimedia tool comes from its design flexibility, theoretical soundness, previously untried approach, and broad accessibility by diverse groups. It will be available on computers, cell phones and by other portably available technology devices for broad usage. ■

IN THE EMERGING FIELD OF SERIOUS GAMES, members of the USC community have produced some of its most successful projects to date – projects which have helped users to identify with diverse others, stand up against injustice, and learn about pathways to college. The USC Serious Games Initiative aims to create a serious games research community that spans schools, research domains, and varieties of expertise by: promoting sustained relationships amongst all groups; educating all involved about the processes of serious games design, research, and education; and equipping USC scholars to effectively compete for funding opportunities that require or welcome games and interactive media components.

THE SERIOUS BUSINESS

~ OF GAMES ~

The Serious Game's Principal Investigators are **Dr. Tracy Fullerton** of the School of Cinematic Arts and **Dr. Henry Jenkins** of the Annenberg School for Communication & Journalism, School of Cinematic Arts, and Rossier School of Education. These leaders and their students bring to the table an informal community of serious game designers whose projects cover broad interdisciplinary topics such as public health, civics and history, and investigate the need, effectiveness and cultural fit of serious games. Currently, the Serious Games Initiative membership comprises faculty and students from numerous departments across five schools, and outreach efforts – cross-campus and inter-campus – remain a top priority.

For more information, please contact **SeriousGamesUSC@gmail.com**. ■

BUILDING CAPACITY TO support students in military families

IN APRIL 2011, FIRST LADY MICHELLE OBAMA AND DR. JILL BIDEN, the vice president's wife, launched a national campaign to increase support for military families, which regularly deal with frequent moves and school transfers, and multiple deployments. "Unlike our troops, military families don't wear uniforms so we don't always see them," Mrs. Obama said. The effort follows a government plan to step up housing, education, health and other programs for military families.

More than any other conflict since World War II, the long war in Afghanistan and Iraq has stressed the families of those who serve. Pentagon documents show an alarming increase in mental health problems incurred by military children. In 2007-2008 the demand of military children seeking psychiatric services doubled to 2 million mental health outpatient visits, compared to 1 million visits at the start of the Iraq war. While public schools can play a critical role in increasing resilience of children to separation, loss, and other effects of parental deployment, there are no evidence-based interventions addressing this challenge in civilian environments. Currently, there are approximately 1.3 million school-aged children with parents on active duty.

In fact, the Department of Defense Education Activity has recognized the critical role that supportive school environments can play. Eighty-six thousand children on military bases across the world are benefitting from additional services, sensitized teachers, and special curricula. However, public schools in communities around military bases occupy a different world – a world of civilians often not attuned to the psychology of military life.

At USC, an interdisciplinary team of researchers is already working to help schools address the unique challenges faced by students in military families. **Dr. Ron Avi Astor**, Rossier Professor and Richard M. and Ann L. Thor Professor in Urban Social Development in USC School of Social Work, is principal investigator for a $7.6 million project funded by the Department of Defense Education Activity (DoDEA). The four-year initiative aims to transform the responsiveness of public schools by partnering with school districts near military bases in San Diego and Riverside as a prototype. The research team will test a school-wide intervention model that can be generalized to public schools nationwide, and create a new graduate training specialization in military families. New training materials including information on military culture, secondary PTSD, childhood depression, learning impacts of separation, and military life will be developed in both online and face-to-face formats. School staff will be guided on new ways to construct protective classroom climates.

The initiative is a partnership between USC and eight military-connected districts with approximately 117,000 students, 10.1% of whom are military. It will identify and provide appropriate supports for military students by creating a clearinghouse of evidence-based best practices (EBP), helping stakeholders select the most appropriate EBPs, and assisting the districts in their implementation.

Rossier Ph.D. candidates **Kris De Pedro** and **Monica Esqueda** are part of the research team, and are currently conducting a qualitative study on the perceptions of educators at military-connected schools on the academic issues and challenges facing military-connected students.

The USC initiative will include 72,000 contact hours from a cadre of Master of Social Work interns and their mentors. USC has augmented the California Healthy Kids Survey with a Military Module that will be disseminated throughout California. Five resource manuals to support implementation will be developed and disseminated through the Oxford University Press. Sustained professional development will occur. USC will create interactive resource manuals based on the print versions and provide online modules of professional development that will be available for future training.

USC will work with other local universities, such as UC San Diego and San Diego State University, to increase the number of trained professionals and services to military-connected schools. Outcomes and processes will be carefully measured to provide documentation on what works best for dissemination to the nation and DoDEA. Through this project, USC expects to build national professional capacity by establishing new curriculum for educators and school social workers in public and private schools. USC will create an evidence-based military curriculum, with training modules leading to specialized certification in this area.

For more information, visit **http://buildingcapacity.usc.edu**. ■