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.

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
Joyce King Stoops Dean

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 Raguena, 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.

Dr. Gisele Ragusa

Dr. Richard Clark
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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 varies of expertise by: promoting sustained relationships amongst all groups; educating all involved about the processes of serious games design, research, and development; and equipping USC scholars to effectively compete for funding opportunities that require or welcome games and interactive media components.

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 for 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 the challenges of military 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 frequent moves and school transfers, other effects of parental deployment, there are no evidence-based interventions addressing the challenges of military environments.

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