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Responsible Conduct of Research: Lessons Learned and Future Plans

For the past seven years, the Council of Graduate Schools has provided leadership in the education of graduate students in the Responsible Conduct of Research (RCR). CGS initiatives began in 2001 through a contract with the Office of Research Integrity (ORI) to conduct workshops at national CGS meetings to prepare graduate deans in the training of graduate students in RCR. In 2004 CGS was awarded an ORI contract that funded pilot programs at ten universities, and in 2006 CGS received an Ethics in Engineering and Science Education (EESE) grant from the National Science Foundation (NSF) to support projects at eight universities. ORI awarded CGS a second contract in 2007 to determine how to institutionalize and expand current best practice programs. Through its RCR projects, CGS has increased the awareness of the need for graduate dean leadership in RCR education, encouraged development of best practice models, and disseminated the results of grant projects to members via concurrent sessions, workshops, websites, and publications.

The NSF EESE grant was recently completed and the eight universities involved shared their projects, insights, and suggestions for future activities during site visits from a CGS team, at a meeting of principal investigators, and at workshops conducted at the CGS Summer Workshop and the Annual Meeting in 2007. This article summarizes the major projects developed under this grant and the insights gained at the eight funded institutions: Bradley University, Brown University, Old Dominion University, Rockhurst University, University of Alabama-Birmingham, University of Kansas, University of Oklahoma, and the University of Nebraska-Lincoln. It also describes the recent ORI contract goals and future plans for advancing the education of graduate students in ethics and RCR education.

Best Practices

Each NSF-funded university added something unique to the growing body of pedagogical practices in RCR education. With an array of projects and approaches, other universities can select and adapt models that best fit their size, mission, and culture. The pilot projects fell into seven categories: publications, case study development, on-line training, courses, seminars and orientations, assessment strategies, and special projects.

Publications. Old Dominion developed a catalogue of lectures and instructional videos related to ethics, RCR, and professional development that was made available to faculty to use in existing courses or for development of new courses. The University of Kansas revised a publication created through the ORI grant, *The Digital Difference: Responsible Conduct of Research in a Digital World* (which is available in print and on-line formats) and began work on a collection of essays, *Conducting Responsible Scholarship at the University of Kansas*.

Case Studies. Bradley University and Rockhurst University partnered to develop case study modules with discussion questions that could be used in research classes. Old Dominion began development of a series of web-based modules incorporating scenarios and self-checks on the topics of data management and ownership, intellectual property/copyrights/patents, conflict of interest, and conflict resolution. The University of Alabama-Birmingham (UAB) developed three case studies on plagiarism, whistle blowing by graduate students, and cross-cultural miscommunication through a focus group process involving faculty and graduate students. Videos for the first two are being developed that build discussion questions into the video in a process called QVQ—Query, Videoclip, Query. The University of Nebraska-Lincoln (UNL) developed three video vignettes and discussion questions on authorship, conflict of interest, and research misconduct. The videos are on the UNL Graduate School and Research Integrity websites and are also on the public access portion of the CITI (Collaborative Institutional Training Initiative) website for RCR. Both UAB and UNL used students and faculty from the theatre and film departments to assist in production of the videos.

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On-line training. Bradley, Brown, Rockhurst, UNL and Oklahoma used CITI modules. Brown used it as a program resource for faculty. Bradley and Rockhurst developed a shared Blackboard site for their faculty members to discuss CITI modules. Rockhurst faculty completed CITI modules as part of a restructuring of their IRB process. Pre- and post-testing of graduate students in a pilot project was a second part of the on-line project. The case studies developed jointly will be on both universities' websites. Old Dominion developed on-line training modules dealing with ethics and moral responsibility; compliance—legal, ethical, and professional; mentoring and advising; and plagiarism, falsification, and fabrication. UAB's video vignettes will be used on-line and in classrooms. UNL used online CITI tutorials and their video vignettes. Oklahoma also drew from CITI modules for their instructional activities.

Courses. Bradley developed new content for existing methods courses. Brown created a three-day seminar course that will be taught to students in chemistry, physics, and engineering. At Old Dominion the Preparing Future Faculty committee is developing a certificate program to include on-line modules and companion workshops, a portfolio requirement and participation in a lecture series. UAB currently has an RCR course for biomedical students and a similar course is being developed for students in engineering, natural sciences, and mathematics. Kansas developed workshops for a cadre of faculty in ethical reasoning and developed an interdisciplinary course. UNL developed a semester course and held a graduate student workshop using the video vignettes and group discussions. Oklahoma prepared faculty to teach a two-day course. Focus groups assisted in developing the course which consists of ten modules.

Seminars and Orientations. Bradley will require graduate students on research assistantships to participate in a seminar and receive RCR certification. Brown developed a program called *Academy in Context* which is a dinner series including lectures and discussions on ethics issues across disciplines. An introduction to RCR is given during an orientation seminar. Old Dominion developed a lecture series that is taped and available to faculty and students. An RCR module is included in orientation. UAB has a series of workshops on RCR topics. Kansas holds an annual RCR Awareness week that includes lectures and discussions on three campuses. Presentations are taped and included in a video archive.

Assessment Strategies. Bradley requires graduate students to complete the CITI web certification with at least an 80% score. They are also working on interactive virtual seminars with pre- and post-tests. Brown conducted an informal evaluation of the impact of the *Academy in Context* series. A survey is administered after the orientation to assess impact, and on-line evaluations were developed for use after training courses, seminars, and workshops. Old Dominion has pre- and post-tests for all on-line modules. They expanded use of a previously

developed RCR Attitudes and Practices Survey that was sent to all faculty, graduate students, and administrators. They plan to include an evaluation of ethics and RCR training in exit interviews and they created a faculty subcommittee to survey graduates on the effectiveness of training in career preparation. Rockhurst used a pre-test followed by completion of six modules in the CITI program with at least an 80% score, and a post-test to determine the effectiveness of the modules. Three faculty members on the RCR advisory board constructed the test items. After one year, research faculty will be asked to evaluate the effectiveness of the modules in their courses and students will be given an additional assessment after completing their capstone projects. UAB will assess through their Scientific Integrity course. They are creating pre- and post-tests for the video segments and will create two versions of their videos—with and without discussion questions—to measure outcomes of each. They are planning to include an assessment of RCR preparation in exit interviews. Kansas used the Vanderbilt University Medical Center Test of RCR Knowledge and the Defining Issues Test to assess baseline knowledge of new graduate students in the new RCR course and courses with embedded RCR modules. They recruited volunteers to serve as a control group. UNL used a series of open-ended questions based on Francis Macrina's *Scientific Integrity* evaluation components. Oklahoma developed pre- and post-test ethical decision making measures. They also solicited reactions to the utility of their education program for the participants' current and future work. They examined differences among trained and untrained novice researchers and experts six months after the program using a "think-aloud" technique.

Special Projects. Bradley developed an RCR committee that meets bi-weekly and established a Center for Ethics within the Office of Teacher Education and Faculty Development. Old Dominion established annual faculty mentoring awards with a cash prize. UAB formed a partnership with the University of Alabama-Tuscaloosa and they plan to develop partnerships with other research universities in Alabama. Kansas held a two-day workshop for graduate students in STEM disciplines on how to present arguments on controversial issues in science and how to respond to opposing arguments in a respectful way. Four students were selected to present a public debate on stem cell research with journalism school graduate students serving as a panel of questioners prior to audience questions. UNL gives certificates from the Office of Graduate Studies and a bookstore gift certificate to students completing the RCR program. Oklahoma used its grant to further develop ethical decision making strategies first tested through NIH and NSF grants. They are also developing ways to expand the program.

Lessons Learned

There were many lessons shared at PI meetings, but three stand out. The most consistent lesson cited by the participants was the need for faculty champions and faculty involvement in planning. Most of the universities have an advisory board that helps develop activities and several have workshops to prepare faculty to teach RCR courses or develop modules. It was noted that there is a need for dean-level leadership which is best if supported by the president or provost

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Data Sources: Trends in Graduate Enrollment and Doctoral Degrees at Historically Black Colleges and Universities, 1996 to 2006

African Americans have made great strides in doctoral degree completion over the past decade, according to the 2006 Survey of Earned Doctorates (National Science Foundation [NSF], 2007). The number of African American doctoral recipients increased 27% from 1996 to 2006; in this same period, the total number of Ph.D.s conferred by all U.S. universities grew only 8%. Even more encouraging is that the number of African Americans who received doctorates in science and engineering (S&E) fields more than doubled over the past two decades, according to the National Science Board's *Science and Engineering Indicators* report (National Science Board, 2008). While all types of graduate schools made great efforts to increase graduate enrollment and degree success for African American students, particular attention should be paid to the role that Historically Black Colleges and Universities (HBCUs) have made to raise the number of African American doctoral degree holders.

HBCUs were founded in the late 19th and early 20th centuries with the expressed purpose of providing postsecondary education opportunities to African Americans who had been denied the chance to attend many predominately White colleges and universities (AAUP, 2007). Collectively, the 99 Historically Black institutions (87 four-year public and private colleges and universities, 10 community colleges, and 2 two-year private colleges) currently enroll more than 312,000 students (including 31,000 students in post-baccalaureate programs) and employ over 20,000 faculty members (NCES, 2007a & 2007d). These institutions represent only 4% of all colleges and universities in the U.S., but they account for nearly one-quarter of the African American bachelor's degree recipients (Redd, 2000).

In their early years, most HBCUs provided education at the undergraduate and master's degree levels, and the success of African American graduates from these institutions has been very well chronicled. A report from the USA Group Foundation (Redd, 2000) found that African American bachelor's degree recipients generally have been just as successful in employment and are just as likely to attend graduate/professional schools as those from other colleges and universities.

However, since 1996 more HBCUs have begun to offer doctoral programs as well. In 1996, fewer than one-quarter of the 87 four-year public and private HBCUs awarded doctorates (see Table 1). By 2006, the percentage of HBCUs with doctoral programs grew to 32%, with just under half the four-year public Historically Black institutions offering such programs.

Table 1. Percentage of HBCUs That Offered Doctoral Programs, by Institutional Control, 1996 & 2006

	1996	2006
Public	32%	47%
Private	15%	19%
Total	23%	32%

Sources: NCES, 1997a & 2007a.

The increasing number of institutions offering doctorates has contributed to the recent growth in graduate students attending HBCUs, particularly at the public institutions. Table 2 shows that between 2001 and 2006, the number of graduate students at public HBCUs increased 12%, and during the

Table 2. Percentage Change in Total Number of Graduate Students Attending HBCUs, by Institutional Control, 1996 to 2006

	1996-2000	2001-2006	1996-2006
Public	3%	12%	17%
Private	-9%	8%	9%
Total	1%	11%	15%

Sources: NCES, 1997b, 2002a, and 2007b.

entire 1996-to-2006 time span, the number of graduate students at these institutions grew 17%. Private HBCUs saw a 9% gain in graduate students during the past decade.

The combined increase in numbers of HBCUs offering doctorates and the number of graduate students attending these institutions has led to a rapid growth in the number of African Americans receiving Ph.D.s and other doctoral degrees. During the past decade, the number of doctorates conferred to African Americans by HBCUs surged 82% (see Table 3). More importantly, in the past five years, the percentage increases in African American doctorates from HBCUs appears to have accelerated, while growth in the number of these awards overall has slowed. Between 2001 and 2006, the number of doctorates to African Americans

Table 3. Percentage Change in Doctoral Degrees Awarded to African Americans at HBCUs Compared With All U.S. Universities, 1996 to 2006

	1996-2000	2001-2006	1996-2006
HBCUs*	35%	36%	82%
All Universities*	25%	3%	27%

*Includes awards to U.S. citizens and permanent residents only.
Sources: NCES, 1997c, 2002b, & 2007c; NSF, 2007.

from HBCUs gained 36%, while the overall increase in doctorates to all African Americans rose 3%.

HBCUs thus have become even more important in providing graduate education opportunities and success for African Americans. In spite of these gains, African Americans still account for just 6% of all doctorates granted to U.S. citizens (NSF, 2007). All institutions will have to make even greater efforts to increase African American enrollment and persistence in graduate education. HBCUs will undoubtedly play an important role in expanding educational opportunities for these under-represented students.

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Data Sources: Trends in Graduate Enrollment and Doctoral Degrees at Historically Black Colleges and Universities, 1996 to 2006

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By Kenneth E. Redd, Director of Research and Policy Analysis

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but the deans have to involve faculty or a culture will not be impacted.

A second crucial lesson was that the programs cannot be directed at graduate students only. Faculty, post-doctoral fellows, research scientists, and research administrators need to be involved in all aspects of the program. Since RCR and ethics education has not been a focal point of many graduate programs, it is often necessary to raise awareness among those who work with graduate students. Principal Investigators also raised several questions regarding the best time and best way to provide instruction. The general conclusion was that it needs to begin early and be part of the entire education process. Different interventions are appropriate at different stages since students will not have a research framework in their first semester but can consider ethical issues related to professional practice. While on-line modules were commonly used, there was agreement that they need to be accompanied by discussions and that they cannot meet the educational needs alone. Embedding ethics and RCR content throughout the curriculum, in discussions about laboratory or research practices, and in Preparing Future Faculty and Preparing Future Professional programs is essential.

A third key lesson was that there is a considerable body of resources available and that there is tremendous potential for reinventing wheels. It was suggested that the CGS website should develop a clearinghouse of resources that can be used directly or adapted.

Future Plans

NSF Grant

CGS will publish a monograph in summer 2008 that includes more details on the best practice models developed through the NSF grant. The website will be updated and expanded based on the suggestions from the PI group to create a clearinghouse. The website will also include tables summarizing the content of this article so that others who want to benefit from the grantees' experiences know who has developed programs in specific areas.

ORI Contract

The new ORI contract is for three-and-a-half years. Universities funded through the sub awards will assist CGS in developing a demonstration and institutionalization project that will address the issues of sustainability, assessment, and dissemination within a national framework. The project has at its core a blue ribbon advisory board of national experts in ethics and RCR education and graduate deans. The group will assist in framing an RFP to be released in April by outlining the core issues to be addressed for successful institutionalization. This project will assist CGS in moving closer to its goal of complete integration of RCR education in graduate education.

By Diana Carlin, CGS Dean in Residence and Director of International Outreach

New Deans and Titles

Mary W. Atwell is Interim Dean, College of Graduate and Professional Studies at Radford University. She replaces Carole L. Seyfrit.

Kathleen Bands is Dean, Graduate School at Hood College. She replaces Francis Sweeney.

Richard G. Bowker is Interim Dean, Graduate Studies and Research at Western Kentucky University. He replaces Elmer Gray.

Allan M. Brandt is Dean, Graduate School of Arts & Sciences at Harvard University. He replaces Theda R. Skocpol.

Cathy Cohen is Deputy Provost, Graduate Education at the University of Chicago.

Dennis R. DeLong is Dean, Center for Graduate and Continuing Studies at Caldwell College.

John DiNardo is Vice Provost, Academic Affairs at Drexel University. He replaces Kenneth Blank.

Lawrence K. Duffy is Interim Dean, Graduate School at the University of Alaska Fairbanks. He replaces Susan Henrichs.

Edward J. Dupuy is Dean of Graduate Studies at Savannah College of Art and Design.

Richard Greenwald is Dean of the Caspersen School of Graduate Studies at Drew University. He replaces Edye Lawler.

William G. Hagar is Associate Provost for Graduate Studies at the University of Massachusetts Boston. He replaces Kristine Alster.

Peter Holland is Acting Dean, The Graduate School at the University of Notre Dame. He replaces Donald Pope-Davis.

Gilda Morelli is Vice Provost for Graduate Education at Boston College.

William M. Pierce is Interim Dean, Graduate School at the University of Louisville. He replaces Ronald Atlas.

Edward Schneider is Interim Dean, Graduate Health Science and Associate Dean, College of Medicine at the University of Tennessee Health Science Center. He replaces Richard Pepler.

Linda Weems is Dean, Graduate School at Eastern New Mexico University. She replaces Phillip Shelley.

Ellen M. Weissinger is Dean for Graduate Studies at the University of Nebraska-Lincoln.

Welcome New Members:

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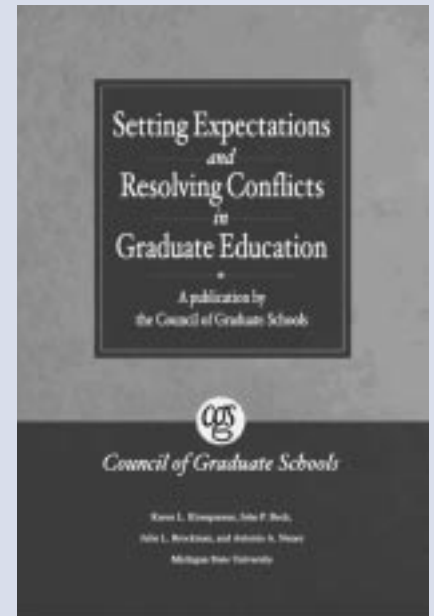
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New Publications in 2008!

Available Now:

Setting Expectations and Resolving Conflicts (2008) provides concrete advice for overcoming the conflicts that may arise between students and their advisors and which may ultimately lead to a student's departure from a graduate program or from graduate study, altogether. This monograph provides a model, specifically adapted to the faculty/student relationship in a graduate education setting, that makes individual and joint interests visible and thereby expands options for articulating expectations and resolving conflicts. Authors Karen Klomparens, Graduate Dean at Michigan State University and her colleagues developed this publication out of a series of workshops presented at CGS Annual Meetings and at U.S. universities since 1997. This is a significant contribution to the growing literature on graduate mentoring. This monograph should be of interest to faculty advisors and graduate students, as well as campus leaders and administrators, all of whom share responsibility of graduate student progress and degree completion and for improving graduate mentoring and advising. Price: \$17 members (\$20 non-members), bulk pricing available. [To order, visit the CGS Online Bookstore: <http://www.cgsnet.org>]



Coming in April:

Global Perspectives on Graduate Education: Proceedings from the Strategic Leaders Global Summit on Graduate Education

The Council of Graduate Schools in partnership with the Province of Alberta convened graduate education leaders in Banff, Alberta, Canada, in September 2007, to launch a global conversation about best practices in graduate education and map concrete directions for future collaborations. This publication includes concept papers prepared by participants from Canada, Australia, China, Europe, and the United States and the international discussions that those papers inspired. We share the thoughtful reflections of key leaders on the global forces affecting international collaborations so they may serve as a reference point for future discussions and activities.

Summer-Fall Publications:

Research Student and Supervisor (revised and updated)
Professional Development for Graduate Students
Graduate Education 2020

CGS Welcomes New Staff

M. Nancy Vincent joined CGS in December and serves as Program Manager for Best Practices at the Council of Graduate Schools. As such she reviews and analyzes institutional practices dealing with the Professional Master's Degree and Responsible Conduct of Research in graduate education. She was formerly Housing Coordinator for the Mental Health Association of Montgomery County, Maryland and Director of the Montgomery County Alliance of Private Nonprofit Organizations. Ms. Vincent has extensive advocacy experience at the state and local levels. She is a member of the American Society of Public Administration as well as several civic associations. She received her Master's degree in Public Administration from the University of Southern California and a B.S. in Public Management from the University of Arizona.

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Communicator encourages and welcomes members to submit articles of interest for inclusion in the newsletter. Current research, hot topics in graduate education, new legislation, and other pertinent information are desired. All manuscripts will be reviewed by a small group of graduate deans and if selected for publication will be scheduled for publication at the editor's discretion. Articles will be edited to conform to style. Inquiries about proper formatting for submissions and comments about *Communicator* may be directed to the Council of Graduate Schools.

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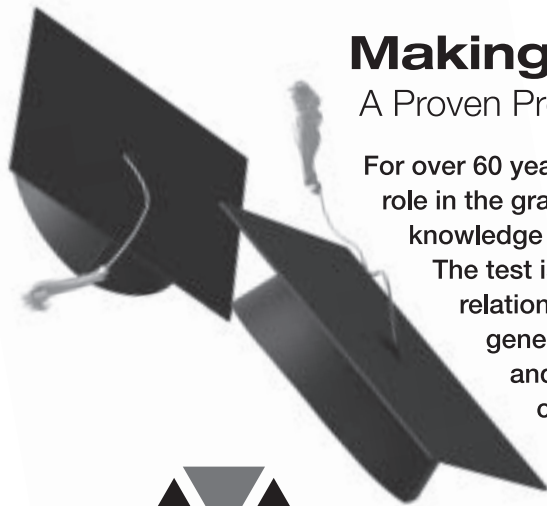
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