How to Engage In Collaborative Curriculum Design to Foster Undergraduate Inquiry and Research in All Disciplines

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Overview

When faculty and administrators are asked if undergraduates in the social sciences and humanities on their campuses have ample opportunities to engage repeatedly in original work and scholarship, these educators agree that, ideally, the number of such experiences should be increased. Currently, most campuses contain at least a small number of innovative faculty members who have incorporated student inquiry using the methods of the discipline, student-led investigations, and communication of the results into their otherwise conventional courses. However, these faculty tend to work as individuals, and they tend to have very little influence on the design of courses beyond their own or on the curriculum as a whole. Instead, the pragmatic majority of faculty are largely satisfied with

their own lecture courses. These faculty members feel no urgency to find the time that would be necessary to introduce changes into their pedagogy. They are largely unaware of the growing body of evidence that demonstrates that lecture courses and other types of courses that emphasize the transmission of information from the ''expert'' to the student actually hinder the student's cognitive development. Students emerge from such courses with a weaker conceptual understanding and less desire to relate the subject matter to the world around them than they possessed at the start of the semester (Wieman, 2004).

Faculty who act as individuals and attempt to introduce productive changes are often discouraged by student resistance. For example, at an early developmental stage, students may believe that their role is to receive information and unconsciously assume that there is a ''hidden prerequisite'' to original inquiry: something in addition that they would need to have mastered before embarking on their own work (Erikson, Strommer, 1991). Other students trust their personal experiences and rely solely on their assumptions and preconceptions, which are often not explicit. Such students are unlikely to venture beyond consulting a few references (since these seem more than adequate), and they are often not open to considering points of view that appear to challenge their own beliefs. Both types of students are looking for ''truth'' and place little value on complexity, interpretation, investigation or discovery, which are essential habits of mind for enlightened citizens and leaders in a complex society.

Taken together, these observations present an interesting paradox. On the one hand, there are innovative faculty members who have designed courses that meet the educational needs of their developing students and teach these students to acquire and interpret new information in our rapidly changing world. On the other hand, individual faculty who encounter difficulties in changing their courses feel unsupported and isolated. They cannot utilize productive innovations of their colleagues, since mechanisms to communicate the value of such innovations are lacking. We suggest that collaborative curriculum development involving faculty and administrators offers an exciting resolution of this paradox.

In collaborative curriculum development, the multiple perspectives and collective academic experience of faculty yield rich ideas for changing courses and the classroom environment. Such changes may be initiated by a small group of faculty, or they may be initiated by the administration. Regardless of the origins, it is essential for the proper balance to be found between a clear program structure with leadership roles that are known and agreed upon and flexibility to permit continued improvements and incorporation of unanticipated ideas. The programs that we describe here were each implemented at large research universities by collaborating faculty and administrators, but their origins and structures are quite different. The first, the annual Summer Institute in the Arts and Humanities at the University of Washington in Seattle (http://www.washington.edu/research/urp/sinst/), was created by an administrator in collaboration with faculty as a response to an identified need to provide new opportunities for students of the humanities to engage in scholarly work. The second, the Graduate Research Consultant Program at the University of North Carolina–Chapel Hill (http://

www.unc.edu/depts/our/GRCprogram.html), began with two administrators who developed a series of research questions to learn what kinds of support faculty would need to provide research opportunities for their students within otherwise conventional classes in the social sciences. Despite their different origins, the two programs converged on several common elements that are discussed further in the recommended practices. While our experiences stem from our roles as educators in large research universities, several of these elements would appear to be applicable to additional educational settings.

The annual Summer Institute in the Arts and Humanities at the University of Washington in Seattle engages a team of four faculty from different disciplines to create an interdisciplinary scholarly framework within which they collaboratively guide 20 selected undergraduates to develop individual scholarly papers or creative works. The program gives students in the humanities and arts the opportunity to immerse themselves in intensive scholarly work for a summer term, and it provides faculty the opportunity to develop interdisciplinary teaching and research collaborations with students and colleagues from a variety of departments and units. By engaging a different group of faculty, themes, and students each year, the Institute provides faculty development and is an annual source of new instructional approaches—several faculty from the first four years have continued to teach courses that evolved from their Institute experience or have continued research collaborations with their Institute colleagues. Thus, a relatively small ''boutique'' program can influence teaching and research for a much larger number of students and faculty. Examples of Institute themes and faculty are provided in Table 1.

For the students, selected through a competitive process, the Institute is a full-time credit-bearing experience. All admitted students receive a $3,000 scholarship from a university endowment, which is important to keeping this opportunity accessible to all students who qualify for it. Although the Institute itself only admits 20 students each summer, it attracts dozens more applicants and focuses interest and prestige on the participation of undergraduates in scholarly work. The public forum for final presentations of Institute work, and the publication of the Institute magazine raise the demand for opportunities for undergraduate research in the humanities and increase the commitment of faculty to providing these types of experiences for their students. One measure of this change is the percentage of students from arts, humanities, and discursive social sciences who participate in the UW's annual undergraduate research symposium. In 2001, 27 of the 196 presenters (14%) at this event were from these disciplines; in 2004, 92 of the 399 student presentations (23%) featured research in the arts, humanities, or discursive social sciences.

The University of Washington's Simpson Center for the Humanities is engaged in nurturing interdisciplinary, thematic research collaborations among faculty and therefore was a natural partner in creating this new program. The Center director works closely with the Undergraduate Research Program director to recruit and select the cohort of faculty leaders for each Institute. Currently, faculty interest in leading the Institute has grown such that rather than recruiting leaders for

Table 1. Themes, disciplines of lead faculty, and samples of student work from the Summer Institute in the Arts and Humanities at the University of Washington.

Year	Theme	Disciplines	Sample Student Projects
2002	Innovations: Text, Technologies, and New Media in the Ancient World and Contemporary Cultures	Art History, Digital Arts, Near Eastern Languages and Literature, Classics	• *Plato's* Phaedrus*: A Critique of Reading* • *Text as a Weapon: 4th Century Athenian Treatment of Spartan Literacy*
2003	Culture and Globalization	International Studies, English (2), History	• *Power Structures and Empire: Methods of Control and Dominance and the United States' Invasion of the Philippines*
2004	Trauma, Time, and Memory	Digital Arts (2), Women Studies, Comparative History of Ideas	• *Angel Hands: A Play About Trauma, Time, and Memory*
2005	Becoming Strangers: Travel, Trust, and Collaboration	Comparative History of Ideas, English, Photography (2)	• *Alternative Landscapes: Traditions in Cartography and Native Land Perception in North America*

each summer, planning is underway with several different groups of faculty for 2–3 years into the future. Institute faculty are paid at 50% for the summer term and awarded a planning stipend during the preceding academic year, which is essential to engaging faculty for whom external grant funding is less available than for their counterparts in the sciences.

While the Institute was created in response to the lack of opportunities for students in the humanities to work closely with faculty on original research, it has evolved into an equally important opportunity for faculty to develop instructional strategies that include undergraduate research and to build interdisciplinary and collaborative approaches into their teaching and scholarly work. Faculty and students of the humanities often see their research as a solitary enterprise; the Institute creates a scholarly community where participants can learn from others' perspectives and ideas while developing their own original projects. Providing a framework for collaborative planning and program assessment is critical to realizing these benefits for faculty and, ultimately, for students.

The Graduate Research Consultant (GRC) program at the University of North Carolina–Chapel Hill enables faculty to convert conventional course projects or assignments into research projects by bringing advanced graduate students into their courses for part of the semester to direct the projects. Research projects are

defined as opportunities in which students use the methods of the discipline to pose questions, apply those methods in investigation, and communicate formally their findings to others. The faculty develop, guide, and evaluate the research component with the assistance of the graduate students, who work with both the instructor and the student during the concentrated period of the course when the students are planning, carrying out, and communicating their research. The graduate students serve only as ''consultants'' and play no role in evaluating student work. Examples of courses that have utilized GRCs and the research projects that have been undertaken are listed in Table 2.

The elements of the GRC program were the product of collaborative design involving the Director of the Office of Undergraduate Research (OUR), the Director of Curriculum Development at the Center for Teaching and Learning (CTL), and several social science faculty. The program design was also driven by a series of initial research questions: What resources would faculty need to convert course projects to research projects? How could a pilot program be implemented and evaluated? and What would happen as a consequence of the pilot program? This collaborative, investigative framework has encouraged faculty to make productive changes in their courses (over 2,000 students have undertaken research projects in 56 courses since the inception of the program in 2003), and these faculty have both refined their ways of working with students and communicated their successes to others.

Each GRC is paid for 30 hours of work during the semester at the standard teaching assistant rate. The number of GRCs used per course has varied depending

Table 2. Examples of GRC program projects in undergraduate courses

Discipline	Sample projects
Geography	• media representations of place and geopolitics • new forms of global governance • politics of urban growth • landscapes, memory, political identity
English	• create an archive of documents and materials for use in writing a biography of a woman • contribute the biography to the course anthology
Sociology	• design survey to determine attitudes toward Muslims among Americans • administer surveys during spring break to obtain geographic distribution • analyze survey data in conjunction with student's particular research questions
Marine Science	• analysis of density structure, oxygen, and chlorophyll-a distributions in the Neuse River estuary • comparison of sampling techniques, including USGS monitoring stations

on the nature of the research components. In several of the courses, these components were the result of faculty-graduate student collaborative efforts. Unanticipated but welcome program developments included multidisciplinary elements that were introduced by the several faculty who decided to recruit GRCs from other disciplines to contribute to their courses. In addition, since graduate students can serve as instructors of record for courses on our campus, such graduate-led courses now include collaborating GRCs. Currently, the number of graduate students wishing to serve as GRCs exceeds the course demand, which is likely to help to drive continued expansion of the program.

Recommended Practices

1. Begin with both a clear leadership strategy and with a collaborative exploration involving faculty and administrators that addresses an identified need

The convergence of campus need, grassroots faculty innovation, and administrative action provides a powerful environment for new program initiatives. Any one of these elements can only effect local change—or worse, uncoordinated efforts can sometimes work against each other. Bringing them together can transform campus culture and the student experience. For an undergraduate research administrator, the balancing act of growing a new initiative often involves providing a clear structure and direction to a team of faculty and staff collaborators, while ensuring that team members' ideas enrich and inform a design that most effectively addresses the program goals. Depending on their disciplines, faculty may or may not be accustomed to working collaboratively on research, but few are comfortable working collaboratively on new course design or developing new instructional approaches. The administrator's role therefore includes providing incentives and encouragement to faculty to engage new pedagogies and to work with colleagues to implement them in their courses as well as helping to foster and shape individual innovations to benefit a larger constituency.

As an example of collaborative program development, four years ago the University of Washington's Undergraduate Research Program (URP) surveyed faculty about undergraduate involvement in research. The survey was motivated by a desire to create new opportunities for students in the humanities to learn through inquiry, as was becoming more commonplace for their counterparts in the natural sciences. URP found that while all faculty viewed inviting undergraduates into their research largely as a teaching function, faculty in the sciences and humanities had different perceptions of the benefits they and their students derive from a research experience. Faculty in the sciences cited such benefits as students' contributions to publications and the ability of undergraduates to tackle high-risk projects. In contrast, their (fewer) counterparts in the humanities primarily cited the personal satisfaction gained from mentoring bright students (Beyer, 2003). Further conversation with faculty in the humanities revealed that while there was some openness to the idea of undergraduate research, many were uncertain about how to collaborate with their students in a mutually productive

way. Humanities faculty with whom we spoke also expressed a reluctance to collaborate with colleagues or take on additional (teaching) responsibilities, particularly while venturing into unfamiliar pedagogical territory.

Based on these results and continued conversations with faculty, the URP decided to experiment with an initiative that provided incentives (i.e., summer salary and a planning stipend) for faculty to collaboratively develop and teach a research-oriented intensive summer program. Faculty participants would be ''converted'' to this pedagogical approach, and by inviting a new team into the program each year, additional enthusiasts for undergraduate participation in scholarly work would be created. Until this time, URP's activities had been largely directed toward the natural sciences, therefore the successful launch of this initiative needed a strong connection with the humanities. As the unit on campus most involved with encouraging collaboration among humanities faculty, the Simpson Center for the Humanities provided that connection as well as valuable advice on themes and pedagogies important to catching the interest of accomplished scholars and artists.

Collaborative planning is fraught with the challenges of working with diverse groups of faculty and staff, and it generally requires more resources than a program that is designed and implemented by a single entity. However, the potential for collaborative programs to influence the campus culture is much greater. An undergraduate research initiative relies on the talent and dedication of faculty and staff who mentor the students and coordinate the program—fostering their involvement in program design will produce a stronger result and ensure a more lasting influence on their teaching and practice.

2. Develop an investigative framework to provide energy and monitor progress

Faculty who participate in collaborative curriculum development are often energized by knowing that they are contributing to an initial pilot program, since their experiences will influence subsequent program development. The following research questions were used to develop the GRC program and could be adapted for new curricula in a variety of educational settings.

a. Is the relatively modest GRC support adequate to encourage faculty to provide research opportunities within courses for students?

In the short, online application for support from the GRC program, we ask faculty to describe both current research opportunities in their courses and to provide examples of possible research projects if their applications are approved. A small number of faculty were already incorporating research components into their classes, and they were particularly excited about involving the graduate students in a highly satisfactory form of teaching. For most of the faculty, the addition of the GRCs allowed changes in course design. We have found that faculty structured the research experiences in very different ways. For example, the addition of four GRCs enabled one faculty member in Communication Studies (155 students) to ask students to work in groups to propose a research question, conduct interviews and administer surveys, analyze their data, and prepare a PowerPoint presentation summarizing their findings. These experiences differed

dramatically from those in previous classes, where instead students watched a contemporary film and ''applied'' theories to analyze it. In contrast, a faculty member in American Studies requested GRCs with expertise in both data analysis and public policy for a first-year seminar (20 students) who carried out research on barriers for individuals with mobility disabilities that exist in the 16-campus UNC system. The majority of faculty we have interviewed have said that they would not have implemented the research component without the support of the GRC. We conclude that the GRC support does result in course changes, although some courses require more GRCs than others, depending on the nature of the research component.

b. What needs to be planned deliberately for this collaborative model to work effectively for faculty and GRCs?

When we initiated the GRC pilot program, we knew the basic administration program elements: establishing program communications; recruiting faculty; developing an application and proposal review process; setting up the payroll for GRC stipends; and documenting each course in terms of such descriptors as level, numbers of students, and types of projects. Underlying these administrative elements were core parts of the program—our overall purpose and commitment to collaborative ways of working. As the program developed over two years and we engaged with the participants, we added elements to enhance the program, some in response to faculty questions and suggestions we had not anticipated initially. For example, to acknowledge faculty and graduate student involvement and the existence of the program, we sent award letters to each faculty member (with copies to the department chair and the Director of Undergraduate Studies) and to each GRC (with copies to the department chair and to the Director of Graduate Studies in the GRC's Department). Early on at a meeting with the Directors of Undergraduate Studies, the DUS had recommended a number of courses from their departments that would be good candidates for integrating undergraduate research, and these letters also served to let them know that the recommendations and involvement had an effect.

Other changes and additions over the first two years included a streamlined online application process from the OUR web site; a Frequently Asked Questions page for faculty, including quotes from our program evaluation; and a mid-year lunch discussion with all faculty and GRCs from past and current semesters invited to discuss their initial expectations of their students and courses and their subsequent experiences. One key administrative issue that we are still considering is how faculty might identify GRCs for their courses. We initially thought that faculty would know and select graduate students in their departments, but we quickly found that faculty in interdisciplinary programs or in departments without graduate-level programs, or faculty with specific needs for special research skills, needed other approaches for identifying GRCs. We resisted the initial suggestion of developing and maintaining a database of GRCs and turned instead to documenting and communicating the recruitment strategies that faculty used that worked well. These included faculty advertising over the graduate student listserv

in specific departments, contacting former GRCs, contacting other GRC faculty or colleagues for recommendations, and contacting research centers on campus.

Initially we left the responsibility for collaboration between GRCs and students to the individual faculty member, but based on participant suggestions, we are planning to hold a brief orientation for GRCs each semester involving GRCs from previous semesters and including recommendations from our evaluation. We continue to listen to program participants and to look for ways to enhance both administrative and program support.

c. Are there characteristics to look for in selecting particularly effective GRCs?

There are several notable characteristics of GRCs that make them effective contributors to undergraduate research classes. During the formative evaluation of the GRC program, the faculty participants were asked to recall what criteria they had established when selecting GRCs for their courses. The most common criteria the faculty cited was the GRCs previous research experience. Specifically, faculty members sought graduate students who had taken part in large-scale research projects, knew how to do research in the context of a single semester, were advanced in coursework, and had an interdisciplinary background. Several faculty participants also expressed the importance of general attitudinal traits they saw as critical for a GRC's success. They believed that GRCs should be enthusiastic and articulate and have a vested interest and ability to work with students.

The undergraduate students also cited numerous characteristics of GRCs that they thought aided their successful completion of the class research projects. The GRCs assisted during numerous points in the research process, including providing guidance on narrowing down research questions, survey design and analysis, where to find primary and secondary sources, how to navigate statistical software applications, and how to write a concise and organized research paper. Several undergraduate students commented that at times they felt more comfortable approaching the GRC than the professor for assistance because they could better relate to someone closer to their student status, and the GRC was more accessible than the professor. In a few instances, students consulted the GRCs when one of their group members was not contributing what was expected and the GRC effectively mediated this process.

d. What in the structure of the interaction between GRCs and students is particularly helpful to students?

The interaction between GRCs and students took a variety of forms. In most classes, the majority of the interactions were centered on in-person meetings with the GRC and student(s) in which they discussed issues related to research methodology, design issues, and survey instruments. All GRCs made themselves available through e-mail and telephone correspondence. The majority of the faculty required that the students meet at least once with the GRC outside of the scheduled class time. On average, each student or groups of students met with the GRC approximately two to three times throughout the semester. Several of

the GRCs also led selected classes, such as classes on methodological and ethical issues and on how to conduct data analysis.

The GRCs helped students learn the intricacies of research methodology in several different ways. A central issue of importance was teaching students the differences between primary and secondary resources. The GRCs walked students through how to use different resources in the library and also provided them with a list of relevant books and journals for their research project. The GRCs also arranged meetings between the students and reference librarians, who provided an overview of how to conduct literature searches.

All faculty members stated that the addition of the GRC to their course changed student attitudes and accomplishments. As one faculty member stated, ''Oh it definitely changed their accomplishments. They would have just gone down in flames without [the GRC]. She was like a one-person methodology course, adviser, and research liaison.'' In many cases, the faculty described the GRC as a powerful role model. They believed that utilizing GRCs in their courses might encourage undergraduates to begin thinking about careers in research. Additionally, the faculty thought it was helpful for students to have interaction with someone other than themselves, since many undergraduate students feel more comfortable asking questions to a graduate student rather than a professor.

e. What amount of time do GRCs need to do this work effectively?

GRCs were paid to work a total of 30 hours over the course of the semester. While this was the set standard recommended by the faculty involved in designing the pilot program, the actual amount of time GRCs worked with students varied across courses. On average, GRCs contributed approximately 20 to 30 hours of work per semester. The majority of these hours were spent directly assisting students with various aspects of their research projects. Additionally, some GRCs spent time collaborating with the faculty member before the semester began on the initial development of the research project, as well as weekly or monthly meetings throughout the semester to discuss the students' progress. In some instances, GRCs dedicated well over the allotted 30 hours of work per semester. However, in all cases the GRCs stated they had a vested interest in working with students and had no complaints about working over the allotted time.

f. What resources would be helpful to sustain and expand the program?

The GRC Program was not started in response to a higher-level administrative directive with appropriate funding. Rather, it started modestly but intently as a collaboration between two academic offices, the Office of Undergraduate Research (OUR) and the Center for Teaching and Learning (CTL). The program drew on existing university resources from the start and continues to do that. Staff members at the two offices spend a small to moderate amount of time on the administrative parts of the program, which have been streamlined over the course of the pilot program. The two offices share the costs of the program, which consist primarily of the stipends paid to GRCs. In addition to these administrative resources, the GRC program directors collaborate with other campus academic offices to support the implementation of the program. For example, staff in Instructional Services

of the House Undergraduate Library offer to develop guides to primary and secondary sources tailored to individual courses and also are available to work with GRCs and small class groups working on specific research questions. The Odum Institute for Research in the Social Sciences offers essential support to GRCs and students with projects involving surveys, data collecting, and analysis.

Administrative support of the program idea has been an extremely important resource in helping the program develop and in recruiting faculty. Both the Dean of the College of Arts and Sciences and the Associate Dean for Undergraduate Education have been advocates for the importance of undergraduate research in general and the GRC program, specifically. Early on, they invited the GRC Program director to present and discuss the program at a meeting of the Directors of Undergraduate Studies, who represent all departments in the College of Arts and Sciences. Other curricular programs, such as the First-Year Seminars, have provided a curricular context for the program, and the APPLES Service-Learning Program is interested in a collaboration to support course-based research service-learning. Using existing university resources not only provides essential administrative and program support but also contributes to the sustainability of the program.

3. Establish multiple mechanisms for ongoing feedback

Program staff members have developed a variety of strategies to gather feedback from Summer Institute participants regarding their learning and research experiences. Since students are selected through an application process, applicant questions and interviews allow Institute faculty to begin to gather data about their students' prior understandings of scholarly research before the summer program begins. In addition, pre- and post-Institute surveys help identify the areas where students need the most support in developing their ideas and also point out concerns that could be addressed in the design of future summer programs. The Institute places high demands on its student participants over a very short period of time; therefore it is critical that faculty and staff respond to problems or concerns that interfere with students' productivity.

The amount of reading required to establish an understanding of the interdisciplinary theme has been a source of many ongoing and post-survey comments, and getting that level right has been critical to the success of the participants. Based on comments from students the first year, they felt overwhelmed by the amount of ''background'' reading required. Subsequent faculty groups have attempted to pare down the reading list required of students before they begin their individual projects while maintaining the ''immersion'' quality of the program that is so important to the eventual accomplishment of a high-level research project.

''There was too much reading in the first few weeks. I am usually a fast reader. As an English major I generally enjoy reading, but I felt overwhelmed and overworked after the first few weeks.'' ~Undergraduate participant, 2002 Institute

''Although the professors assigned a daunting amount of reading—some of it extremely dense and difficult—I think this was actually one of the most beneficial aspects of the Institute. The

total immersion into theory forced me to draw analogies and make critical leaps that would have been impossible otherwise.'' ~Undergraduate participant, 2004 Institute

In summer 2004, the faculty altered their meeting schedule based on the students' request for more large-group discussion time in order to better digest and develop their understanding of core material. Student feedback on the post-Institute survey also helps to identify the specific areas of research methodology that were lacking in their pre-Institute preparation, and the guidance that was most important to the achievement of their scholarly projects, both of which will inform subsequent programs. Finally, post-Institute surveys also highlight the process by which student participants evolve into passionate scholars.

''The academic stretching that went on during our nine-week session could not have operated in a better fashion. The one disturbance: the limited discussion time we experienced the first week of settling into routine was quickly amended when we requested and were granted extended time.'' ~Undergraduate participant, 2004 Institute

''Another huge element, and I am embarrassed to not have thought of this, but our professors taught us the importance of books' bibliographies and resource lists and the importance of more closely scrutinizing of who the publisher was as well as who wrote the forward or preface. Finally, I felt like I was getting somewhere, the system was becoming known to me.'' ~Undergraduate participant, 2004 Institute

''In some ways I was a bit intimidated by the idea of 'scholarly research.'. . . Further, the actual research expectations were high, and I found my own processes of note taking, remembering, and analyzing painfully slow. But the weeks gave way to drafts that soon became concrete analyses of a subject that I found interesting—and I really enjoyed the time I spent alone in the library. While I didn't know what to expect from the research process, I learned more than I can put down on paper. The professors, the feedback of other students, and the shifts that occurred in my own mind elevated my passions and pushed my ability to critically think to a level that I didn't know I was capable of reaching.'' ~Undergraduate participant, 2003 Institute

Feedback is also obtained in a variety of ways from participants in the GRC program. First, during the summer of 2004, the OUR and CTL carried out a formative assessment of the program by interviewing all the faculty and GRCs involved to date and a few randomly selected students from each class. The response was overwhelmingly positive. Undergraduate students cited numerous benefits of the research component, including the opportunity for hands-on learning, exposure to valuable library and Web resources, increased knowledge in statistical methods, and greater confidence in conducting primary research.

''. . . I feel like I have a lot more power over the research. It's not like I have to go seek all this information out and maybe I'll find it, maybe I won't. I feel a lot more confident that I know how to do it and that it's not a big scary thing. I feel much more in control of doing it.'' ~Undergraduate student

''I definitely think this [research project] *is valuable because I haven't had any other classes where we've had to use SPSS or any of those programs, so I've done research projects but never with statistical analysis. And so it was very beneficial in that I learned how to use data sets and things like that for research. At first, I didn't want to do it going into it, but after I came out of it, I was like wow, I understand things a lot.''* ~Undergraduate student

''. . . it was very valuable because you learned way more on your own then you would ever in a classroom.'' ~Undergraduate student

The 14 graduate students who were interviewed each enjoyed the experience and intend to participate again if possible. The also plan to recommend the program to others and incorporate student research into their own courses in the future.

''My experience as a GRC was exciting—to have a role in allowing students to develop their own field work . . . for me it was exciting to see how that might work and to see what kind of support you might need for that to be successful . . . it was rewarding for me. It was also challenging. It helped me to know, if I were to implement [a research component] in my own course in the future how I might go about structuring it.'' ~Graduate Research Consultant

''It was a great experience to work with undergrad students. It was fantastic to be able to see how the professor set up his class to include these group research projects. More than anything else, I saw a way of how to get undergrads involved in and excited about research.'' ~Graduate Research Consultant

''. . . as another teaching method, having students work in small groups on projects has impressed me as a way to help students learn and gain mastery of some material that they wouldn't in a lecture format. It sort of astounds me how little people absorb from that format. And my role of GRC has helped highlight that for me.'' ~Graduate Research Consultant

The faculty members were also enthusiastic about the program. Many elected to incorporate a multidisciplinary component into the course to utilize the expertise of GRCs outside their own discipline. The faculty also appreciated the assistance they received with the logistics to support student research projects, and they enjoyed supporting graduate students' professional development as instructors and as future faculty members.

''. . . it makes for a better course. Because I'm convinced that the students like to do a research project . . . you want students to really be engaging with the world. And they can do so with research as a complement to what they're learning in class. And there's really not a substitute for that.'' ~Faculty member

''I wouldn't have done the project without a GRC and in particular it worked very well to have his expertise in survey research because I'm not an expert on survey methods. So he was able to describe various scales and talk about different kinds of questions in a way that I couldn't have done. So I appreciated that.'' ~Faculty member

''. . . I was really drawing on her [the GRC's] expertise with having worked in this kind of project. Because I'm trained as an historian, I'm aware of a lot of methodologies, but I haven't actually participated in—especially things that kind of bordered on empirical. She knows the literature a lot more in that regard. So it was invaluable to me to have somebody like that.'' ~Faculty member

In addition, the OUR and CTL directors hold an annual lunch in which program participants are asked to reflect on and discuss their initial expectations and their actual experiences while teaching in the program. Also, we have contributed to several workshop presentations to inform the campus about the GRC program.

Finally, we were invited to obtain perspectives from the Directors of Undergraduate Studies of every department concerning the barriers and benefits of this program for their individual departments, and to suggest courses they knew about that might be suitable. Each of these venues has provided additional information concerning unplanned but welcome program outcomes. The lunch discussions revealed that the GRC program provides an acknowledged, supported curriculum space for faculty to experiment with their teaching and with course design, and these discussions provided a valuable forum for faculty to discuss their innovations with interested colleagues. The workshop presentations revealed that faculty often select GRCs who complement or extend their own research skills, and faculty have also chosen GRCs in order to learn new modes of research at the same time as their students are learning. Also, faculty members have selected GRCs from other disciplines in order to provide an interdisciplinary perspective in the course and the research. In a workshop for graduate students, we learned that former GRCs who subsequently became ''instructors of record'' for additional courses were eager to collaborate with other graduate students to design research components. This (recent) development is particularly exciting, since it will allow graduate students who are in the process of developing their own teaching styles to incorporate research in their initial course designs. The initial meeting with the Directors of Undergraduate Studies alerted us to several interesting courses that were appropriate for the program (allowing us to target our expansion efforts in strategic ways) and also led us to modify our timetables of application solicitation and review in response to their suggestions.

4. Utilize a flexible architecture to encourage implementation of improvements

Each year the Institute is essentially reborn. Undergraduate Research Program staff, with colleagues from the Simpson Center for the Humanities, work with the new faculty to review past assessment data and to design a new program that preserves the essential elements of the program—the exploration of an interdisciplinary theme and the development of original works by students—while incorporating research methodologies and theoretical frameworks relevant to the chosen theme. During the first planning cycle, the program was broadened to include the arts, as many unifying interdisciplinary themes proposed by interested faculty included the creative arts. By cycling faculty leaders from different academic disciplines through the Institute, each year we learn more about how to guide undergraduate research in a variety of disciplinary and interdisciplinary contexts.

Although the faculty who lead the Institute could come together on their own and decide to teach a ''super seminar'' course with high expectations for student projects, it is relatively unlikely that they would do so successfully without the structure, support, and experience offered by the Undergraduate Research Program and the Simpson Center for the Humanities. In addition to the financial support, program staff help faculty to incorporate ''lessons learned'' from previous Institutes, set milestones, and organize resources that support the development of student projects over the short, nine-week timeframe of the summer term. URP

staff provides organizational and logistical support and oversee the participant selection process. Faculty are free to concentrate on developing the conceptual framework within which they will explore the Institute theme with their students and guide each participant through the articulation of an original idea and its development into a scholarly project. Thus each faculty group sees the Institute as their own—reflecting their instructional styles and approaches to research—while also incorporating knowledge gained from the feedback of participants in previous years' Institutes. Program staff is able to provide continuous improvements for the Institute design while respecting the unique nature of each incarnation of the summer program.

The GRC program also has a flexible structure. The pilot program was designed for medium-sized lecture courses in the social sciences, but it quickly spread to include courses in the humanities and natural sciences. In addition, instructors of first-year seminar courses asked to participate, so it is clear that the structure is adaptable to courses of various sizes in all disciplines. The program does constrain what the students will do, in that they must learn to frame questions, carry out appropriate investigations, and communicate their findings within the context of an otherwise ''conventional'' course. While the program encourages faculty and graduate students to collaborate to design these research experiences, the program directors recognize that such collaborations are not always feasible.

5. Seek additional opportunities to sustain the productive innovations so that they become a part of the institutional culture

While the primary motivation for developing the Summer Institute was to provide a new opportunity for undergraduates to become involved in scholarly work, the model that has evolved also has implications for changing the campus culture at UW. In addition to providing opportunities to the Institute participants, the program also stimulates interest among our Institute faculty (and their colleagues) for creating additional opportunities for their undergraduates to share in the knowledge-making enterprise. As these leaders return to their departments, they share their enthusiasm and experience with colleagues and students. In many instances, their teaching and research practices are changed by this experience. Institute collaborations that continue beyond the summer program enrich the faculty leaders' professional lives. One Institute leader wrote: ''participating in the 2004 Summer Institute was the most significant experience I've had in my 12 years as an educator'' (Phillip Thurtle, 2004). Two faculty from the 2005 Summer Institute have just completed teaching a new fall term introductory-level undergraduate course that culminated in a research project and presentation by all 100 students—the course theme built on their previous summer's Institute collaboration. More than three quarters of the faculty who have participated in leading the Institute have continued to supervise undergraduates in research and several have continued to collaborate with their Institute colleagues on interdisciplinary research and teaching following the summer term.

The GRC program has also contributed positively to the expanding ''culture of undergraduate research'' at Carolina. At the time the OUR was established, it

was recognized that there was a need to support faculty across the campus who wished to integrate more research and "inquiry-based" pedagogy into their courses in order to prepare students to undertake meaningful independent projects. One of the responsibilities of the founding director of OUR was to develop such support mechanisms. This combination of focusing both outside and inside the classroom is unusual among undergraduate research programs, but it has served both the UW and Carolina campuses well. The OUR is both the home of the GRC program and a program resource. The GRC program is the curriculum base for undergraduate research, although OUR offers department-based independent study opportunities and summer internships that receive academic credit. As a resource to the GRC program, OUR provides ways to extend the course research experience for both students and the GRCs. Students in the courses learn about other research opportunities, may apply to present their course research projects at OUR's Annual Research Symposium, and may have a PowerPoint summary of their class project posted on the OUR web page. GRCs may become research mentors to students they want to encourage to go further with their class research ideas or to other undergraduate students in their discipline. Finally, many faculty who have utilized GRCs are participating in campus-wide efforts to expand the program. Essential elements of the proposed expansion include department-level review and planning and additional financial resources. These elements are part of the proposed Quality Enhancement Plan for Carolina's upcoming reaffirmation of reaccreditation in spring 2006.

Conclusions

The UW and Carolina programs were developed completely independently, and it is of interest to consider the common outcomes despite the differences in the programs' scope and design. Overall, those designing each program wished to increase the numbers of research opportunities for undergraduates in Social Science and Humanities courses, and we sought to do that within the existing curriculum structure. We developed a program framework that we believed would support our expected outcomes for faculty: (1) to enable faculty to engage undergraduates in research; (2) to offer ways for faculty members to become part of a program where they could experiment and talk about their courses, going beyond the more typical solitary teaching experience; and (3) to encourage faculty to collaborate either with each other or with a graduate student on the research component, recognizing the GRC more as a colleague than an assistant. For students, the main outcome was additional opportunities in which they would learn and apply the methodology of a discipline to ask questions, investigate, interpret findings, and communicate those findings to others. In addition, we wanted students to become aware of additional research opportunities at UW and UNC. The Carolina program had additional outcomes for graduate students. Our primary intent was to enhance the GRC's professional development as a teacher and as a scholar through collaborative work with faculty and students.

Also, we thought the GRC role as research consultant would reaffirm graduate student confidence in academic skills and knowledge. Finally, we wanted the GRC to consider using the GRC model and inquiry learning in their own teaching at UNC or in their future role as a faculty member at another university. We conclude that the core elements of our approaches should be easily adaptable to enhancing the undergraduate experience in a variety of educational settings.

Acknowledgements

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