Provost's Learning Innovations Grant for Faculty
Request for Full Proposal
2000-2001

Please send your completed grant proposal (4 pages, plus attachments), one original and
eleven copies, to
Linda Banford, 4000 Eastman
by 4:30 p.m.
Monday, March 6, 2000.
No hand written proposals will be accepted.
Notification of awards will be made by Monday, April 17, 2000.

Project Title: “Creating an Interdisciplinary Course entitled Analogy,
Mathematics, and Poetry”

Applicant(s):

Name: Professor Marcia Birken
Department: Mathematics & Statistics
Telephone:
475-6832
College: Science

Name: Professor Anne C. Coon
Department: Language & Literature
Telephone:
475-2410
College: Liberal
Arts
I. Project Title: “Creating an Interdisciplinary Course entitled *Analogy, Mathematics, and Poetry*”

**Summary:** In an array of recent collaboratively-authored books and in special programs at Institutions from Georgia Institute of Technology to the University of California at Berkeley, robust interdisciplinary attention is being directed toward the phenomenon of analogous thinking, its origins in the brain, its applications in language and learning, and its role in human expression. As a significant next step in our fifteen-year interdisciplinary collaboration, we propose to conduct research and develop a pilot course on analogy that we believe will find a natural “home” and audience at RIT. This course is tentatively entitled *Analogy, Mathematics, and Poetry,* and as we envision it now, it could be used to fulfill either a Liberal Arts or Math/Science general education requirement. We have begun conducting research to support this course and are requesting funding to support one course release for each of us, during which time we will develop the curriculum for *Analogy, Mathematics, and Poetry.* As part of our preparation for the course, we will also be presenting a paper, “The Pedagogical and Epistemological Uses of Analogy in Poetry and Mathematics,” at the international workshop “Developing Creativity and Large Mental Outlook in the Computer Age” (CLMO 2000). This workshop is part of the European Education Section of the Seventh Conference of the International Society for the Study of European Ideas (ISSEI 2000) to be held in Bergen, Norway, in August 2000.

Although we anticipate conducting a great deal of further research in the development of this course, we do have a “working” idea of its focus and content. *Analogy, Mathematics, and Poetry* will explore the many applications of analogy that are employed in both poetry and mathematics, including explanation, expression, description, discovery, and invention. We will read primary texts from both mathematics and poetry, as well as the writings of individuals who were themselves both poets and mathematicians; we will draw on the wide range of research -- much of it interdisciplinary -- currently being conducted in areas of mathematics, poetics, linguistics, and cognitive science; and we will include a major web-based project in which student research on analogy is made available in an on-line format. We may even encourage the students themselves to engage in cross-disciplinary projects.

II. Targeted Learners: It is our hope that RIT students would be able to select this course to fulfill a Liberal Arts or Math/Science general education requirement. For example, in the College of Liberal Arts, *Analogy, Mathematics, and Poetry* might be taken as a course in the Literature minor; in the College of Science, the course might be part of a mathematics general education sequence. We believe the course would be of special appeal to students with interests in mathematics, computer science, artificial intelligence, logic, literature, and communication. The course would be intended for students at the sophomore level or above. The course enrollment would be limited to 32-35.
III. Anticipated Impact on Teaching and/or Learning
This course will vividly demonstrate the cognitive and creative connections between poetry and mathematics, two disciplines that are not commonly linked together; as such, we believe the course will be intellectually challenging and exciting for both faculty and students. Developing this course will also broaden for each of us our understanding of how analogy is currently being explored in our respective disciplines. By having a major web-based project, we will be encouraging students to further explore the visual element of analogy as they apply what they learn.

IV. Measuring the Impact; Reporting our Findings; Presenting in a Faculty Forum
Student evaluations, as well as our own evaluations of the course, will provide valuable information; we will also look carefully at the kinds and quality of student projects being produced. We will report our findings in a professional paper, and would look forward to presenting our work at a college or Institute faculty colloquium. (In the past, we have presented the results of our prior collaboration at faculty colloquia in both the College of Science and the College of Liberal Arts.)

V. Rationale
a. Why this course is not part of “regular college business”
Because of the interdisciplinary nature of our research and course development, this work is necessarily outside the “regular business” of any single college and relies on collegial and administrative cooperation across colleges.

b. Relevance to required cluster, college, and/or department competencies
This course would bridge a gap which all too often occurs between Liberal Arts and Science at RIT, providing students with an integrated general education experience. While meeting many of the educational goals set forth in both colleges, including fostering critical reading, writing, and thinking, and developing students’ ability to analyze and synthesize material, the proposed course would also explore mathematical foundations of language and linguistic forms of mathematics. The use of appropriate technology to explore and underpin ideas and projects in the course would also meet Institute and department educational goals.

c. Relevance to other faculty; transferability
As on other campuses where groups of individuals have been drawn together in the research and study of analogy, it’s possible that our efforts may attract the interest of other faculty from across the Institute who would want to share their work and expertise in this area. Additionally, we hope to develop a model of cross-disciplinary instruction that could be adapted to other courses, especially courses that might be developed
jointly by faculty in the College of Science and the College of Liberal Arts. By using analogy as the link between our disciplines, we have allowed for flexibility and breadth in selecting readings and designing assignments that will be focused on a single, complex concept. Other faculty interested in such a course might bring their own material and assignments to the study of analogy or adapt this approach to other forms of collaboration across disciplines.

d. Relevant credentials/experience of involved faculty
Our work together began in 1985, designing and team-teaching an interdisciplinary problem-solving course offered to students who were considered “at risk” academically and were enrolled in the Learning Development Center’s College Restoration Program. We later integrated two courses we were teaching in our respective colleges -- English Composition in the College of Liberal Arts and Mathematics Seminar in the College of Science. We designed these courses to have “parallel and overlapping” curricula. Through complementary readings, assignments, and an out-of-class debate project, the two courses, taken simultaneously by first-year mathematics majors, addressed themes from education and technology and introduced concepts of critical thinking and logic. We have published papers together, given talks together at annual professional conferences of both our disciplines, and been invited to speak at the Conference of the American Society for Engineering Education and the Freshman Year Symposium. A selection of our collaborative professional work appears below:

1. Publications


2. Other Conference Papers
"New Educational Technologies - A Formal Debate of Their Value in Postsecondary Education," Conference on Instructional Technology, Pedagogy and the Curriculum, SUNY New Paltz Institute for the Study of Postsecondary Pedagogy, Mohonk, NY. (11/96)

"When Two Cultures Converge: Faculty Collaboration as a Model for Student Interaction," Mathematical Association of America Annual Meetings, San Antonio, TX. (1/93)

3. Lectures and Workshops
"Designing Overlapping and Parallel Curricula for First-year Students," College of Liberal Arts Faculty Colloquium. (11/93)

"The (Liberal) Art and Science of Critical Thinking," workshop, Finger Lakes Community College Teaching Center, Canandaigua, NY. (10/92)

VI. Timetable

Summer 2000 - Travel to Bergen, Norway, where we will attend sessions of the 4-day international workshop "Developing Creativity and Large Mental Outlook in the Computer Age (CLMO 2000) in the European Education Section of the Seventh Conference of the International Society for the Study of European Ideas (ISSEI 2000) and present a paper titled "The Pedagogical and Epistemological Uses of Analogy in Poetry and Mathematics."

Fall 2000 (001) Continue our current research on the pedagogical, epistemological, and creative uses of analogous thinking and representation in a variety of disciplines, including cognitive science, artificial intelligence, poetry, and mathematics.

Winter 2000-2001 (002) Use release time of one course each to develop the curriculum of the course Analogy, Mathematics, and Poetry.

Spring 2001 (003) Offer the pilot course Analogy, Mathematics, and Poetry to RIT students.

June 2001: Evaluate and report on the course.

Fall 2001: Present a faculty forum on our work; revise the course and plan for the second offering.