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Helping Faculty Integrate Technology in Research and Teaching: CART at Bridgewater State College

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This article describes Bridgewater State College's Center for the Advancement of Research and Teaching (CART). CART's role is to prepare all faculty and librarians to take advantage of the opportunities that the new Center for Tecyhnological Applications will make available for the teaching and learning process, not only for students but for faculty. The challenge for CART is to integrate traditional faculty development with technological training as one more tool for the practitioner to enhance teaching and learning. Bridgewater's program has successfully attracted faculty to educational technology, encouraged teaching and research projects through a summer small

grants program, and built a sense of faculty ownership in the Technology Center.

Introduction

Bridgewater State College in Massachusetts is in the process of building a Center for Technological Applications to house extensive computer labs, high-tech classrooms, and science labs complete with interactive data and video and voice link-ups to locations both on and off campus. To encourage faculty to take an active role in the new educational technology facility, two years ago the college formed the Center for the Advancement of Research and Teaching (CART).

CART is a faculty-directed professional development center that integrates both traditional faculty development activities and new activities involving educational technology in teaching and research (Senge, 1990). The Center has had surprising success in:

- attracting faculty to educational technology through programming
- encouraging faculty to start a wide range of teaching and research projects through summer and small grants programs
- engendering faculty support for the Center for Technological Applications by fostering a sense of faculty ownership.

What follows is a two-part discussion of CART's developing importance on the Bridgewater campus and reasons similar centers ought to be developed elsewhere. The first part of the article describes changes in how faculty teach; the second summarizes the response to CART.

The Paradigm Shift in Teaching

The way we teach is changing. This changing paradigm can be illustrated by the following vignettes.

> At 8:01 A.M. the last students meander into the large lecture hall. Professor XXX stands at the lectern, and for the next 75 minutes divulges the contents of a sheaf of yellowing lecture notes. Professor XXX's only movement is from the lectern to the blackboard to scribble indistinguishable hieroglyphics. Although several students furiously take notes, the majority are distracted and instead

count ceiling tiles or catch a much needed nap. The course mid-term exam is next week, but the students are assured of success since Professor XXX hasn't changed the syllabus or exams in 20 years, and the local fraternity houses have better course files than Professor XXX does. Later in the office, Professor XXX meets with advisees to sign the next semester's course form. Unfortunately, Professor XXX's student records are incomplete, so during registration, the chosen courses become filled and students must select alternative courses without any additional advising.

Across the hall, Professor YYY is conducting a class in the college's new electronic classroom. Class documents such as handouts and syllabi are available on-line, and have recently been updated using new word processing equipment. Professor YYY uses no lecture notes, and instead conducts an interactive video disk and multi-media presentation of the new material. Every student actively participates. For those who leave class with further comments to contribute, Professor YYY is accessible via electronic mail (e-mail). The specialized hardware and software available in this classroom include graphing calculators and calculus programs to enhance mathematics instruction and grammar/spell checkers to assist in writing English compositions. Computerized test banks with on-line testing and scoring capabilities allow Professor YYY to easily change and customize exams. In addition, computerized grading programs track the progress of each student and calculate final grades. Professor YYY returns to the office, checks e-mail, and then meets with advisees. The college now uses an on-line registration and advising system, so each student leaves the appointment with a clear understanding of the college's degree requirements and guaranteed placement in the next semester's courses.

Still further down the hall, Professor ZZZ teaches in a traditional classroom, but in a very non-traditional manner. ZZZ groups the chairs in a semi-circle and conducts an intense discussion of freedom of choice in a democratic society. The students have read the text, since they know that out of respect for Professor

ZZZ and their fellow students they are expected to speak from a common base of knowledge. Professor ZZZ has been conducting classroom-based research and has involved the students in the project. Like Professor YYY, Professor ZZZ used on-line academic advising, but has not yet mastered e-mail. ZZZ makes sure to meet with all students at least twice a semester and varies the types of assignments so students can make use of a wide range of skills. ZZZ is well aware of the latest learning theories and how they apply to students with greatly differing learning styles. The students benefit accordingly.

Few faculty's methods are as extreme as either Professor XXX or Professor YYY. Most have individual strengths that they draw upon. Most, like Professor ZZZ, make use of some, but not all forms of technology. At the heart of the faculty development work conducted by CART are programs that would meet the needs of all three professors.

CART's programs include the latest in educational technology, such as on-line library catalogues for literature searches, and Internet communication with other researchers worldwide, and computer software for performing calculations, modeling, and thousands of other applications, as well as the latest thinking in more traditional areas of faculty development, such as classroom research, learning theory, active learning, and case studies on faculty development topics.

At Bridgewater we have discovered three basic strategies to help us encourage faculty to try new ways, including the use of technology, to improve their teaching:

1. accurately define the problem
2. support faculty, financially and collegially
3. integrate technology training with other faculty development activities.

The Center for the Advancement of Research and Teaching (CART) is a faculty development center that was developed in response to the need to change how research and teaching are supported.

Although there have been computers and other technologies at Bridgewater State College for many years, their primary uses were to provide administrative support and to furnish student laboratories (Dreyfus & Dreyfus, 1985). For the past two years computers, soft-

ware, and other technologies have been made more accessible to all faculty, librarians, and administrators. To ensure proper training for all interested users , we found that the following support is required:

1. *College financial support of hardware, software, and training.* This commitment tells the faculty, librarians, and administrators that innovation in teaching and research is a priority.
2. *Peer support.* At Bridgewater many people are willing to share their expertise and experience with their colleagues.
3. *A private, non-threatening environment.* Faculty are more likely to use areas separate from student laboratories.
4. *Integration with other faculty development resources.* These activities need to be integrated so that one doesn't overshadow the other.

CART's Response to the Paradigm Shift

CART's challenge was to help faculty apply shifting paradigms, by building on the existing interest in teaching quality and by broadening faculty views of technology as a tool to enhance teaching and research. Two faculty members were appointed co-coordinators of CART, each released half time from teaching. Initially the co-coordinators decided not to separate the Center's functions into traditional faculty development and training in technology applications, since a successful model for development would have to integrate both dimensions.

The goal of faculty ownership of CART was accomplished by establishing broad-based representation across disciplines using steering and advisory boards. The steering board includes key administrative and faculty leaders on campus and consists of nine members, including the Director of Sponsored Projects, Assistant to the President, Acting Assistant Director of Academic Computing and President of the Faculty Union. The advisory board is a much larger group, chosen exclusively from full-time faculty and librarians to represent almost all academic disciplines. From the large advisory board, four subcommittees were formed that work with the co-coordinators to formulate policy and procedures in the following areas: center opera-

tions, faculty travel awards, faculty small grants and program activities.

CART's successes are evident in three ways:

1. *Attracting faculty to educational technology through programming.*

Separating good teaching and scholarship issues from technological advances misses the opportunity to develop faculty in a number of new ways (Schon, 1987). To attract faculty to educational technology, the co-coordinators designed ways of demonstrating that technology is, first of all, something that can enhance faculty teaching and scholarship. Three examples show how CART helped individual faculty integrate their current work with new technological tools to improve their overall effort:

An English faculty member was notified that his paper had been accepted for inclusion in a conference's proceedings. He was required to submit his work on Word Perfect 5.1. The faculty member brought his typewritten work to CART and the co-coordinator showed him that the scanner would transfer his typewritten work into Word Perfect files, saving him the time of re-typing to meet publication requirements.

Through CART an Earth Sciences and Geography faculty member learned to use computer facilities in the Technology Center to produce a camera ready *Study Guide* to accompany the text book he was using in class. The *Study Guide* was accepted for publication and is now used as a supplement to the text.

CART helped a Management faculty member use current software giving country statistics and cultural information as a supplemental decision-making tool for her students to use in an international marketing course project. The software was shared with a colleague from the Earth Sciences and Geography Department who used it for his students and, in turn, made the geography lab available for management students to use in conjunction with their projects.

Additional, programs introduced faculty and librarians to technological tools that could enhance teaching and scholarship.

The program sub-committee provided suggestions for CART focused on both developmental and technological topics of interest to faculty. More than 20% of the College's faculty attended a day-long session of workshops (entitled the CART Sampler) covering topics such as teaching by the case method, technology oriented scanner, and CD Rom usage for faculty. Most of the workshops were presented by Bridgewater State College faculty members and administrators. This continues to be the working model for CART sponsored programs. A current technology program, the Computer Campfire Series, began with a faculty member training 15 other faculty and staff in the word processing software, WordPerfect. Many of the programs are offered at the Technology Center, encouraging attendees to feel at home in the surroundings and to continue working on the computer related equipment in the Center. CART has actively co-sponsored training sessions on use of electronic classrooms, teleconferences on sexual harassment and race relations, and programs that included video sessions with K. Patricia Cross on classroom research, as well as a brown bag series whose topics included active learning, classroom techniques, ways to deal with large classrooms, and ways to address gender issues in the classroom.

CART owns a collection of books related to teaching techniques and subscribes to journals that discuss teaching methods, both traditional and technology-based. Faculty and librarians go to CART not only to use the books and computer equipment, but also to discuss their teaching and to be exposed to resources appropriate to different methods of teaching.

2. *Encouraging faculty to start a wide range of teaching and research projects, through summer and small grants programs.*

CART was instrumental in establishing the college's first small grant awards for the purpose of enabling faculty and librarians to pursue creative, innovative ideas for the enhancement of research, teaching, and scholarly activities that they otherwise would not have the resources to implement. The administration provided the necessary funding for the small grant awards program. A small grant can be used as a seed grant to work on obtaining the preliminary results that may be used in the preparation of major external grant applications. It also

can be used to participate in technological training workshops so that the grant recipient can offer training sessions at CART for other faculty and librarians. The small grant sub-committee assisted in the development of guidelines, application procedures, and the review process. Small grants are awarded once a year. About 10% of faculty and librarians applied for small grants and about 60% of the applicants were awarded CART funds.

The small grant sub-committee also, in conjunction with the co-coordinators, initiated a summer stipend program to encourage faculty projects and research in the summer months. Many faculty see the summer as an *ideal* time to enhance their scholarship activities. About six percent of the faculty applied for summer grants, out of which one-third were funded. Thus, in the first year alone, about 16% of faculty and librarians applied for small/summer grants and about 50% of the applicants were funded. Previously, the Office of the Vice President for Academic Affairs awarded travel funds for faculty and librarians to attend conferences and scholarly activities. CART now has jurisdiction over these monies and the travel sub-committee was involved in the revision of policy and selection procedures for these travel funds. Travel applications received at CART are evaluated four times a year. Preference is given to presenters and organizers of conferences and workshops. As funds permit, applications from attendees are considered. So far, every applicant has been awarded either full or partial funding (about 25% of the faculty and librarians).

3. *Engendering faculty support and encouraging faculty ownership of CART.*

Faculty were initially apprehensive about using technology for teaching and research, but CART's first two years of programs have encouraged faculty to shift that focus. For example, during the past semester a study of sign-in logs and a review of grant applications indicate that 35% of Bridgewater State College's faculty and librarians have used CART equipment, and resources or attended CART programs. This number has rapidly increased during the second semester and CART's goal for the next academic year is exposure of 60% of the Bridgewater State College faculty and librarians to CART. A review of program evaluations indicates that participants are now voicing comments like "How do I get more involved with the use of

video in the classroom for teaching English composition?" or "How can I tap into the CD-ROM data banks in my field?" Apprehensive comments have been replaced by a series of inquiries concerning integration of technology into teaching and research. Furthermore, since most of the CART workshops and programs have been designed and led by College faculty and administrators, a strong sense of ownership in CART has developed. More important, faculty are now turning to their colleagues across the disciplines for assistance and new ways of collaborating are beginning to appear. It is getting harder to distinguish the "technology literate" from the rest of the faculty. As one faculty member said, "I have gone from techno-phobia to techno-lust." Technology training won't replace traditional faculty development programming, but it does serve as a strong component of any such effort

Conclusion

While much is left to be done, Bridgewater has succeeded in gaining significant administrative support (both financial and otherwise) for CART. In so doing, the College has attempted to address major obstacles toward incorporating instructional/educational technology (Albright & Graf, 1992) into the College curriculum and traditional faculty development efforts. More important, faculty have enthusiastically adopted the CART center and are actively shaping its programs as well as participating in them. While CART is the perfect bridge to the use of educational technology at Bridgewater State College, other institutions need to consider how to adapt its major themes to their needs. These themes are:

1. Integrating traditional faculty development activities with new ones focused on using educational technology in the classroom
2. Developing faculty-led and faculty-designed programs
3. Establishing administrative and financial support for a wide range of programs tailored to meet individual faculty needs, including small research grant programs and travel grant programs

4. Integrating technology into the undergraduate curriculum in a wide variety of ways
5. Ensuring an adequate support system to help faculty adapt to ever new and changing technologies
6. Designing a safe and supportive environment for faculty to explore a wide range of new educational technologies.

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