Evaluation of the 1999-2000 Center for Instructional Technology Incentive Grant Program

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Executive Summary

In May of 1999, the Center for Instructional Technology announced a program of instructional technology incentive grants to Duke faculty. The goal of the program was to encourage faculty to experiment with current technologies and develop creative new applications of technology to address instructional needs. The CIT advisory board determined the format of the grant program, reviewed proposals and chose projects to receive funding for the 1999-2000 school year.

Overall, this first round of grants has been successful in supporting a wide range of experiments with instructional technology and increasing faculty awareness and discussion of the uses of technology in teaching and learning. This report summarizes what has worked well for this group of faculty, what obstacles they encountered as they completed their projects and how the CIT grant program has been modified to better serve faculty during the 2000-2001 school year.

Summary of key findings

1. Faculty from a variety of schools and departments participated in the grant program. Their projects affected a range of courses and students.

2. The grant program encouraged development or use of a wide range of instructional technologies.

3. The educational goals for CIT-funded projects focused on increasing student participation, interest and learning in the courses in which new technologies were applied.

4. Faculty felt that their students reacted positively to their projects and, in many cases, worked at a higher level and were more engaged in course work.

5. Faculty concluded that their projects were successful.

6. The projects faculty completed this year are likely to be reused and expanded in the coming year.

7. Faculty who participated in the CIT funded projects feel the university sends mixed messages about the importance of instructional technology and does not provide adequate recognition and reward for the level of effort required.

8. Most faculty found that IT projects took significantly more time and required more technical support or training than they had anticipated.

9. The grant program provided a way for schools and departments to leverage other efforts to incorporate instructional technology.

10. The grant program pointed out problems with overall technology infrastructure at Duke and disparities among different areas of the university in access to technology support services.

11. The grant program promoted exchange of information and collaboration across schools and departments and created positive publicity for Duke.

Modifications to 2000-01 grant program based on feedback from the first year

1. Improve the proposal development and proposal review process.

2. Provide support beyond or in lieu of funding to project participants.

3. Leverage resources and ensure adequate levels of funding.

4. Provide more specific resources and support for faculty to improve project assessment.

About the grant program

The CIT issued a call for proposals on May 1, 1999. During May and June of 1999, the CIT received 34 project proposals requesting a total of $488,000. The CIT advisory board – faculty members from each school plus representatives from the Library, the Office of Information Technology and from the Information Technology Advisory Committee – met on May 28th and on June 30th to review proposals and award funding to projects.

The review committee judged proposals on the basis of these criteria:

- Broad and continuing impact
- Feasibility
- Innovative use of technology to address an instructional need
- Evidence of school, department or external support
- Support of university goals

The CIT advisory board viewed this first year of funding as an experiment and thus chose a mixture of ambitious and modest projects using a variety of technologies and drawing faculty from several different schools and departments. The CIT offered grants to 24 projects using $150,000 in internal funds, $13,000 from an anonymous donor and $10,000 provided by the Office of Information Technology. One faculty member declined the grant stating that he did not have enough time to do the project. The CIT advisory board discussed the grant program at several meetings during the 1999-2000 school year and used information from project participants to make modifications to the grant program for the 2000-01 school year.

Related links:

Call for proposals and selection criteria for the 1999 grants http://cit.duke.edu/funding/incentive-grants/grants-1999-cfp.pdf

List of projects and grant awards for 1999 http://cit.duke.edu/funding/incentive-grants/grants-1999-awards.html

CIT Advisory Board information http://cit.duke.edu/about/advisory-board.html

How information was collected about the projects and the grant program

The conclusions in this report are based on several different sources of information. Project proposals contained information about initial goals, planned methods for accomplishing the goals and intended strategies for measuring project success. The CIT organized a discussion session in September 1999 where faculty elaborated on their preliminary project goals, development strategies and assessment plans. In February 2000, project leaders filled out a brief, e-mail status report about their projects. Throughout the second semester, CIT staff formally interviewed 18 project leaders to learn more about how their projects were progressing and what kinds of help, if any, they needed. CIT staff also met with many of the project participants informally throughout the year, visiting them in their offices, attending classroom presentation and offering training and guidance on different aspects of projects.

Twelve of the project leaders gave presentations to groups of faculty and staff during the year. These presentations provided useful information about the projects and the grant program. All project leaders completed the end-of-project questionnaire distributed by the CIT in June 2000. Some faculty provided additional reports about their projects, and almost all faculty offered files or web links with illustrative samples of their work.

Related links:

Project proposals and examples for funded projects http://cit.duke.edu/funding/incentive-grants/grants-1999-awards.html

End-of-project questionnaire http://cit.duke.edu/cgi-bin/grantreportform.pl

Project proposals and awards http://cit.duke.edu/funding/incentive-grants/grants-1999-awards.html

Key findings with explanation

1. Faculty from a variety of schools and departments participated in the grant program. Their projects affected a range of courses and students.

Six schools had at least one project funded through this CIT grant program. Although the School of Engineering had no CIT funded projects, eighteen faculty from that school participated in a joint CIT-School of Engineering workshop on using instructional technology in the spring of 1999. During the same time, CIT staff worked with Divinity School faculty and staff as they developed a grant proposal for instructional technology funding from the Lilly Foundation. Thus, the CIT was involved in some kind of project planning or support in almost every school.

Number of faculty participating in CIT grant-funded projects for 1999-2000, by school:

School	# instructors as project leaders	# other instructors	Total instructors	% of total instructors
Arts & Sciences	15	13	28	60.9%
Divinity School	0	0	0	0.0%
Fuqua School of Business	1	2	3	6.5%
Graduate School	1	1	2	4.3%
Nicholas School of Environment	0	1	1	2.2%
Pratt School of Engineering	0	1	1	2.2%
School of Law	1	1	2	4.3%
School of Medicine	2	2	4	8.7%
School of Nursing	3	2	5	10.9%
Total	23	23	46	100.0%

Arts and Sciences faculty participating in CIT grant-funded projects for 1999-2000, by department

Department	# faculty	% of all A & S
Mathematics	5	17.9%
Physics	4	14.3%
Political Science	4	14.3%
Computer Science	4	14.3%
History	3	10.7%
Slavic Languages	3	10.7%
Center for Doc. Photography	2	7.1%
Biology	1	3.6%
Economics	1	3.6%
German	1	3.6%
Total	28	100.0%

Courses and students using the projects, by school, during the 1999-2000 school year:

School	# courses [1]	% all courses	# students [2]	% all students
Arts & Sciences	24	68.6%	1231	74.3%
Divinity School	0	0.0%	0	0.0%
Fuqua School of Business	0	0.0%	0	0.0%
Graduate School	2	5.7%	16	1.0%
Nicholas School of Environ.	0	0.0%	0	0.0%
Pratt School of Engineering	0	0.0%	0	0.0%
School of Law	2	5.7%	268	16.2%
School of Medicine	4	11.4%	4	0.2%
School of Nursing	3	8.6%	137	8.3%
Total	35	100.0%	1656	100.0%

Note 1: A quarter of the projects were not fully implemented and did not provide course impact information. Many projects were used in more than one course.

Note 2: Includes all student participants in any course. Numbers may include the same student in more than one course.

2. The grant program encouraged development or use of a wide range of instructional technologies.

Faculty created many different types of instructional technology products, with most focusing on creating course web pages, digital materials or student exercises. Several of the projects involved creating a general technology infrastructure to be used in multiple ways in the future (e.g., Digital Durham, WebAssign, Video Professor).

Types of technology products created *in these projects:*

	# projects*	% projects
CourseInfo web page	10	43.5%
Non-CourseInfo web page	16	69.6%
Digital materials (e.g., digital video or audio files, scanned images)	14	60.9%
Student exercise modules	10	43.5%
CD ROM	2	8.7%
Student-created web pages	6	26.1%
Electronic Portfolio	2	8.7%
Other: create software for course, create multimedia/database applications, create streaming audio, create distance ed lectures, create web-homework system; xml documents	5	21.7%

* Number of projects = 23. Respondents could indicate more than one technology.

Most faculty used more than one type of technology while completing their projects.

Types of technologies faculty used *during their projects:*

	# projects*	% projects
PowerPoint	8	34.8%
Web editing tools	19	82.6%
Scanning/digitizing tools	11	47.8%
Video editing tools	6	26.1%
Video conferencing	1	4.3%
Statistical applications	3	13.0%
Scientific applications	3	13.0%
Lab instruments (e.g., calculator)	1	4.3%
Other: database, Fortran, C++, XMGR, Linux, Oracle Intermedia, Bitcasting, Computer projection, Real Player/Presenter, Toolbook, Audio editing, Multimedia authoring, TGIF drawing program, java tools, Zope, PHP, xml, assorted software	7	30.4%

* Number of projects = 23. Respondents could indicate more than one technology.

3. The educational goals for CIT-funded projects focused on increasing student participation, interest and learning in the courses in which new technologies were applied.

Most faculty had several teaching and learning goals for their projects.

Desired teaching/learning outcomes listed by faculty project leaders:

	# projects	% projects
Increasing student participation in class activities	14	60.9%
Increasing professor-student interaction	9	39.1%
Increasing interaction among students	7	30.4%
Making course materials more accessible	16	69.6%
Increasing student interest in the course	18	78.3%
Facilitating active learning	17	73.9%
Increasing student learning	16	69.6%
Involving students in research	5	21.7%
Exposing students to team-based, problem-oriented analysis	5	21.7%
Promoting computational skills	5	21.7%
Helping students improve written communication skills	9	39.1%
Other:	6	26.1%
Provide graduate student with teaching and curriculum development experience; create public repository for finished analyses; Repurpose content; improve quality and learning experience; involve faculty in IT-based course delivery; Provide students with authentic experience in using technology; assist students in meeting NC Department of Public Instruction required competencies in IT; provide faculty with quick access to student work.; Improve asynchronous course availability		

*Note: Number of projects = 23. Respondents could indicate more than one goal.

Most of the faculty project leaders did not have a formal assessment plan for measuring achievement of their goals. The three faculty members who conducted formal measures of changes in student learning concluded students did learn more. Several faculty members pointed out that it was hard to measure the direct impact of their projects because the introduction of technology was usually only one of several changes within the course.

Methods faculty used to assess the outcomes of their projects:

Method	# projects	% projects
Course evaluations	5	21.7%
Informal student feedback	4	17.4%
Formal student surveys about course materials	6	26.1%
Faculty judgment about how well students applied what was learned in class projects	3	13.0%
Statistics on student use of course web site	4	17.4%
Student performance on faculty developed tests & quizzes	2	8.7%
Peer review of student presentations	2	8.7%
Performance on standardized tests/national board exams	2	8.7%
Correlated student participation in online problem sets with performance on midterm exams	1	4.3%
Pre and post assessment of student skills or conceptual understanding	2	8.7%
Course evaluations	5	21.7%
No specific assessment done	3	13.0%

* Number of projects = 23. Respondents could indicate more than one response.

4. Faculty felt that their students reacted positively to their projects and, in many cases, worked at a higher level and were more engaged in the course.

The vast majority of the project leaders felt their students' overall reaction was positive.

My students' overall reaction to my project was:

	# projects*	% of projects
Very positive	7	35.0%
Positive	11	55.0%
Neutral	2	10.0%
Negative	0	0.0%
Very negative	0	0.0%
Total	20	100.0%

* Note: Three faculty who did not fully implement their project did not answer the question.

When asked what students liked best, faculty mentioned the following

- Increased access to course materials
- Improved organization of course materials
- More rapid feedback and better feedback about their level of understanding of the materials
- Ability to communicate outside class and see each others' papers and comments
- Sense of accomplishment and competency as they developed new skills
- Integration of research and learning
- [Student web projects] made it possible for parents to see their work and the professor's comments

Most of faculty member's comments about what students liked least focused on technical problems, such as slow access to materials over modems, network congestion and difficulty using particular software packages. A few faculty pointed out that students disliked the increased workload created not only by the need to learn new technology, but also by the more challenging intellectual work enabled by the new technology.

5. Faculty concluded that their projects were successful.

Most faculty (19 out of 23) completed at least the initial implementation of their project by the end of the spring semester. For the six faculty who did not finish their project this year, three of them anticipated at the beginning that their project would extend into the next year; the other three had unexpected delays this year but plan to finish their project in the 2000-01 school year. All except one faculty member (who did not finish a project this year) felt their projects were successful.

Overall, how would you rate your project?

	# projects	% projects
Very successful	14	60.9%
Moderately successful	8	34.8%
Not very successful	1	4.3%
Total	23	100.0%

Most of the reasons faculty gave for considering their projects a success centered around two themes: 1) improvements in the course materials and 2) greater student engagement in the course and student learning. Faculty cited the following as successful aspects of their projects:

- The project increased access to course materials.
- Materials were better integrated and better organized.
- Assignments were more individualized.
- Students made active use of the course materials.
- Students worked at a higher level
- Students were more interested and engaged with the course.
- Students demonstrated good communication skills in project activities through their writing, their participation in electronic discussion sessions and their classroom presentations.
- Faculty developed technical skills and understanding about instructional technology that will be useful to them in future courses.

6. The projects faculty completed this year are likely to be reused and expanded in the coming year.

All faculty who received CIT grants plan to continue using the materials they developed during their projects, and most plan to expand some part of their project in the coming year and to encourage other faculty to use their project. Several faculty members indicated that the web site that they created during their project will become a long-term repository of materials for use in later courses.

Faculty member's future plans for this project:

	# projects	% projects
Using it in the same course in a future semester	20	87.0%
Using it in a different course in a future semester	14	60.9%
Training other faculty to use the project	12	52.2%
Encouraging other faculty to use the project	15	65.2%
Securing additional funding to expand the project	7	30.4%
Adding content	18	78.3%
Will not be using this project again	0	0.0%
Other:	6	26.1%
Collaborating w/other departments to leverage expertise; Training more graduate students to teach using such methods; Will use expertise developed through project in future classes; Permanent shift to electronic portfolio instead of written one; Sharing with faculty at other (non-Duke) schools; Incorporating into high-school materials		

Note: Total projects = 23. Respondents could select more than one answer.

7. Faculty who participated in the CIT funded projects feel the university sends mixed messages about the importance of instructional technology and does not provide adequate recognition and reward for the level of effort required.

This theme came up repeatedly in conversations with faculty and in the end-of-project reports. Typical comments included:

"The central problem is that, at many levels, the administration at Duke does not consider the development of innovative curricular materials to be a significant scholarly activity. The model is that one should do this with a minimal amount of one's time. In fact, doing this sort of thing well is very labor intensive and more than a full-time activity."

"The institution needs to demonstrate to senior faculty that effective use of instructional technology is valuable and it needs to compensate and recognize the faculty who stray from tradition and venture to incorporate technology into their teaching. …I don't think the University will get large numbers of junior faculty using IT because the tenure system values scholarship over teaching. IT is probably a death sentence for a junior faculty member. Senior

faculty have greater freedom to take risks but they tend to be less venturesome--the technology is more alien and they have little reason to change their teaching strategies which have served them well for so long."

8. Most faculty found that IT projects took significantly more time and required more technical support or training than they had anticipated.

When asked about problems they encountered, or advice they would give to others undertaking similar projects, faculty mention time more than any other factor. Faculty found that it took a long time to learn to use new technological tools, or the tools they originally chose were not adequate for the projects, or the work simply took longer than they had estimated. Some faculty do not want to invest this much time, even though they are supportive of continuing to use technology in their courses.

In many projects, faculty made significant changes to the course content and organization in addition to adding new technology to the course, and the volume of change was sometimes hard to manage.

Several faculty members listed as a problem the lower-than-expected skill levels of students. Students taking courses were not always prepared to complete the new technology-enhanced course activities successfully, and student workers assisting with IT projects needed more training and supervision than project leaders anticipated.

9. The grant program provided a way for schools and departments to leverage other efforts to incorporate instructional technology.

A number of CIT funded projects received additional funding or technical support from their schools or departments, were part of other curricular changes within the school or department, extended activities supported by external funding or served as pilot projects in preparation for seeking additional funds.

Resources used to complete and implement this project:

	# projects*	% projects
Computer projection in class	17	73.9%
Computers in computer classroom	9	39.1%
Public computing clusters	10	43.5%
Special training outside of class time	10	43.5%
A programmer employed specifically for this project	7	30.4%
A graduate student, TA or work-student student	13	56.5%
Other:	6	26.1%
CIT helped with online evaluations; In-house web professional; Fuqua knowledge infrastructure; Extensive help from CIT staff; Recording studio, video & audio editing systems; Multimedia authoring tools; 3 half-time programmers		

* Note: Total projects = 23. Respondents could choose more than one answer.

Received technical support from the following sources:

	# projects*	% projects
Office of Information Technology	7	30.4%
Center for Instructional Technology	9	39.1%
Technical staff in your department or school	13	56.5%
Peers	7	30.4%
Graduate student employees	4	17.4%
Undergraduate student employees	7	30.4%

* Note: Total projects = 23. Respondents could choose more than one answer.

The budgeted funding for this project was adequate:

	#projects	% projects
Yes	18	78.3%
No	4	17.4%
no answer	1	4.3%
Total	23	78.3%

I had the following unexpected expenses (includes using resources outside of project scope):

hardware (3)	labor (4)
software (3)	books and manuals (3)

I secured additional funding or in kind support from:

Department Chair (2)	Office of Naval Research (1)
Dean/school (3)	U.S. Dept. of Education (1)
Foundation (3)	Private donor (1)

10. The grant program pointed out some problems with technology infrastructure at Duke and disparities among different areas of the university in access to technology support services.

In several proposals, faculty requested funding for services that were supposedly already provided in their school or through OIT. There were a variety of reasons: faculty were unaware that the services existed; faculty didn't understand how to take advantage of the service; or faculty had problems using the service in the past and were looking for an alternative. For example, several faculty members requested servers or server space for course use even though their department, their school or OIT provided some type of server space that might have been used. These faculty didn't take advantage of that existing server space because a) they didn't know it was available; b) they couldn't figure out who to contact to request assistance; c) no one was available to provide the customized help they needed to utilize an existing server; or d) policies for server use prohibited the kinds of projects faculty wanted to do. As another example, projects sometimes requested scanners, digital video and audio tools or web-development software for their student workers. If some of this equipment and software had been publicly available, multiple projects could have used it, and the grant funding could have been spent on more specialized types of project support.

With a better infrastructure in place, Duke could get a better return on investment since CIT wouldn't have to provide duplicate equipment and services and could instead concentrate on the pedagogical and content issues involved in the projects.

11. The grant program promoted exchange of information and collaboration across schools and departments and created positive publicity for Duke.

CIT brought project participants together in formal and informal ways. Throughout the year, CIT staff referred projects participants to other faculty with experience in the technologies they were using. Twelve project leaders gave presentations through the CIT-sponsored speakers series, and several also gave presentations within their schools. At least two projects were featured in news releases, and several projects were highlighted in the fall 1999 Library magazine. At the end of the spring semester, the CIT hosted a reception to thank faculty for their work and to publicize the efforts of those who had engaged in instructional technology projects during the year.

I collaborated with the following groups in completing my project:

	# projects	% projects
Other colleges or universities	2	8.7%
Other schools or departments at Duke	5	21.7%
Corporate sponsors	0	0.0%
Independent groups or organizations	1	4.3%

* Note: Total projects = 23. Respondents could choose more than one answer.

Related links:

CIT events are listed on the web at http://cit.duke.edu/cgi-bin/event.pl

Gronke project news release http://www.dukenews.duke.edu/Policy/int-pol.htm

Modifications to 2000-01 program based on faculty feedback

1. Improve the proposal development and proposal review process.

   A number of proposals were vague, especially with regard to providing a clear statement of educational goals and a detailed plan for assessing those goals. Consequently, it took the CIT advisory board a long time to review proposals and made it difficult to make funding decisions. To address this problem, the 2000-01 call for proposals provided more detailed guidelines, pointed faculty to the online guide to assessing IT projects and gave examples of project proposals. CIT staff met in advance with most of the individuals who submitted proposals in the second year of the grant program to help them develop explicit project plans. (See also # 3 below.)

   Related links:

   Call for proposals for 2000-01 grant program http://cit.duke.edu/funding/incentive-grants/grants-2000-cfp.pdf

2. Provide support beyond or in lieu of funding to project participants.

   A number of project leaders had difficulty finding student workers and difficulty finding the time to do some of their project activities. To address this problem, the CIT staff sought and obtained funding for a different kind of grant program this year which matches faculty with student workers instead of providing funds to the faculty member. Five faculty are currently experimenting with this approach to project support under the Dell FAST-start program. The CIT made a second change in this year's grant program in response to feedback from the first year's recipients. Instead of providing direct funding to several faculty who proposed to do multimedia projects in 2000-01, the CIT used some of the grant funds to purchase a multimedia server and software which can support several projects in a consistent way. By developing this infrastructure, the CIT will be able to assist several faculty this year and additional faculty in future years. Faculty will be able to focus on content development instead of technical design.

   Related links:

   Dell FAST-start program description http://cit.duke.edu/funding/fast-start/index.html

   CIT grant awards for 2000 http://cit.duke.edu/funding/incentive-grants/grants-2000-awards.html

3. Leverage resources and ensure adequate levels of funding.

   A number of faculty proposed good projects but the budgets needed to complete those projects were beyond the scope of the CIT grant program. Some faculty proposed projects that were very similar to ones completed by other faculty at Duke or elsewhere. To ensure the best return on investment of these grant funds, the CIT is organizing a project planning workshop series in Fall 2000. These workshops will provide faculty with information about exemplary projects, offer suggestions for writing good proposals and

describe additional funding sources. The Office of Sponsored Research, the Corporate and Foundation Relations group of the development office and the Center for Teaching, Learning and Writing are collaborating with the CIT on this workshop series.

Related links:

Successful IT project workshop series http://cit.duke.edu/funding/workshops-planning.html

4. Provide more specific resources and support for faculty to improve project assessment.

Faculty varied widely in their assessment strategies, making it difficulty to understand fully the impact of these projects on teaching and learning. CIT staff have created an assessment guide for IT projects and are using this guide in consulting with faculty. The project planning workshop series to be held this fall will stress identifying clear educational goals and developing an assessment plan matched to those goals. Finally, project leaders will be asked to provide more specific assessment data in their project for 2000-01.

Related links:

Assessment guide for instructional technology projects http://cit.duke.edu/resource-guides/development-assessment.html