THE GRADUATE SCHOOL AND UNIVERSITY CENTER
THE CITY UNIVERSITY OF NEW YORK

PROPOSAL

FOR A CERTIFICATE PROGRAM IN
INTERACTIVE TECHNOLOGY AND PEDAGOGY

March 2001

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PURPOSES AND OBJECTIVES OF THE PROPOSED PROGRAM

The Graduate School and University Center (GC) of The City University of New York (CUNY) proposes to establish a Certificate Program in Interactive Technology and Pedagogy for students enrolled in Ph.D. programs at The Graduate Center. The proposed program responds to strong doctoral student demand for interactive digital technology (IT[i]) training and certification. Interactive digital technology includes, but is not limited to, computer assisted classroom instruction that enhances faculty lectures and student presentations and assignments and encompasses a broad range of classroom approaches. These include the incorporation of Web sites in support of basic course work (e.g. online syllabi and assignments and Web-based discussion groups), computer laboratories that make it easier for students to complete IT assignments, and the development by faculty, staff and advanced students of interactive multimedia course and research materials in a range of digital formats (e.g. CD- and DVD-ROM; Web-based media streaming; digital video and audio). If approved, the certificate program will better prepare doctoral students for life and work in the contemporary university as well as impart valuable IT skills and experience that will make GC Ph.D. holders more competitive when they enter academic and nonacademic job markets. Colleges and universities are increasingly seeking to hire new faculty members who have had prior experience using IT in the classroom and can help incorporate new technologies into the curriculum.

The sequence of courses described below (see "Curriculum and Course Description") provides theoretical, historical, philosophical, and sociological perspectives on technology and pedagogy and their intersection in the classroom. The program will provide students with the critical skills to reflect on and then design and implement a range of IT solutions (including, but not limited to, course Web pages, online discussion groups, specialized course software tools, and the design and production of multimedia presentations) for use in teaching, primarily at the college level. Like other certificate programs at the GC, IT as a subject is an emergent, but not discrete, field, and

its study is well served by multidisciplinary approaches. Unlike Film Studies or American Studies, for example, analysis of IT can effectively draw from theoretical frameworks developed across the humanities, the social science, and the hard science disciplines.

Through its elaboration of topics covered in existing CUNY doctoral courses, the IT program will draw on the discipline-based expertise of many doctoral faculty members and thereby build a collective conversation about the broad implications of emerging educational technology. The interdisciplinary approach envisioned for this certificate program aspires to inform and complement the scholarship and pedagogy of enrolled students, in their graduate—and postgraduate—teaching and research. It is expected that possession of the ITP certificate will represent to potential employers a scholar well versed in the theoretical and practical aspects of IT at the university, and thereby assist doctoral students in their pursuit of employment in the academy and beyond.

In terms of the institutional embrace of IT studies, majors associated with information technology have been established over the past few years at several universities, including Stanford and Cornell. At this time, an IT-focused certificate program for doctoral students is unique. The looming presence of IT in the workplace, the academy, and the home demands critical reflection— reflection that will be well served by theories and models drawn from art history, computer science, history, education, philosophy, psychology, and sociology. A critical, theoretical approach to the matrix of IT, theory, and pedagogy should help doctoral students identify and reflect on the possibilities and limitations of approaches within their respective disciplines and, as a result, allow them to create, test, and refine new paradigms for teaching and learning.

Admission into the Certificate Program is open to all doctoral students enrolled at The Graduate Center based on the approval of the Executive Officer of the Ph.D. program in which the student is enrolled. Credit for courses taken in the Certificate Program will be part of the approved course work of the doctoral program in which the student is enrolled. Like all GC certificate programs, the Certificate Program in Interactive Technology and Pedagogy will be limited to CUNY doctoral students; the certificate will be awarded only when the doctoral degree is conferred.

RATIONALE FOR INTERACTIVE TECHNOLOGY AND PEDAGOGY CERTIFICATE PROGRAM

The question of IT in the university is no longer a yes-or-no query: it is a matter of when and how. The matter of when is a question of resources, and it is a question that university administrators across the country are addressing. The matter of how, though, is a question for research scholars, and it raises questions proper to philosophy and psychology, to sociology and history. IT creates new possibilities for in-class activities and research methodologies, and educators need to ascertain, develop, and evaluate the proper uses of IT in the university library, laboratory, and classroom. Any doctoral student, regardless of discipline, who chooses to ignore the impact of IT on research and teaching does so at his or her own peril. Experience with IT tools is increasingly valued by departments in the humanities, the social sciences, and the hard sciences. The urgency of these concerns informs the effort to establish the GC Certificate Program in Interactive Technology and Pedagogy.

As noted above, interactive digital technology is transforming everyday life at the university. Across the country, at all levels of postsecondary education, IT has informed and altered research and educational practices. E-mail and the World Wide Web ("the Web") have transformed the way students and professors communicate and conduct research; they also offer new possibilities for promoting different modes of learning. Students can now receive a master's degree in electrical engineering from Stanford University without setting foot on campus. The Western Governors University, the California Virtual University, and the University of Phoenix all offer degree-oriented courses to undergraduate students via "virtual classrooms."[ii]

As an object of study, IT is quickly becoming institutionalized. Students at Cornell University can major in Science and Technology Studies. At Stanford University, undergraduates can major in Science, Technology, and Society; at MIT, students in this field can earn a Ph.D.[iii] Academic journals, including *Science, Technology, and Human Values; Technology and Learning; New Media and Society;* and *Technology and Culture*, have published numerous IT-focused articles. These programs and journals extend and refine research on the impact of technology on work, play, and everyday

life, much in the same way that scholars in the 1950s theorized the emergence of an earlier and now-dominant form of information technology: television.

In the world of academic journals, some editorial boards not only examine IT; they embrace the formal possibilities it offers for scholars and writers. Members of the American Studies Association can find a recent issue of *American Quarterly*[iv] on the Web; the general public has access to previous issues, formatted to allow "digital readers" engaged in research to cite the page numbers of the article in hard-copy form. For the *Journal of MultiMedia History,*[v] the reader has access not only to the document itself, but, in this case, also to the key primary sources. In the journal's debut issue (1998, 1:1), Claude E. Clegg III formatted speeches by Elijah Muhammad from 1960 via digital audio recording and made them accessible to digital readers. At Carnegie Mellon's eserver.org,[vi] users have access to over 26,000 works on-line, primarily in the arts and humanities, with links to academically oriented chat rooms. With the Open Archive, a project in development by a group of 25 international scholars, the Web will be used to house a formidable international collection of academic papers. The goal of the Open Archive is to make the public archives of universities across the globe available through one international, virtual archive, complete with doctoral dissertations and peer-review journals.

The City University of New York, and the GC in particular, has been at the forefront of earlier IT developments for the University. In the late 1960s, CUNY developed the City University Mutual Benefit Instructional Network (CUMBIN), which linked Brooklyn, City, Hunter, Queens, and the College of Staten Island via closed-circuit television, with the GC as the broadcast hub. Remote sites received audio and video transmission, and students asked questions via microphones set up at each site. Doctoral faculty in Chemistry, Electrical Engineering, and Physics used CUMBIN to link students engaged in lab research at individual campuses. At one point, Chemistry professors broadcast 15 hours a week of instruction from the GC. CUMBIN proved fruitful for a dozen years, at which point this early experiment combining IT and distance learning was concluded. Interest in IT at CUNY began to pick up again throughout the 1990s with a number of initiatives launched to orient CUNY faculty to new forms of IT. To date, no systematic efforts have been undertaken to introduce GC students to this expansive field.

As an object of practice, interest in IT and the university has transformed college computer labs into centers for information technology. From Columbia University to the University of Washington, new labs for design and implementation of IT tools are on the rise. Rare, however, is the program that offers doctoral students the structured opportunities and the necessary resources to theorize, develop, test, and reflect on IT for the classroom.

The proposed certificate program will provide participants with the tools necessary to accelerate their development as teachers and researchers and, subsequently, provide them with knowledge and skills that will benefit their future job choices. The program is designed to promote sound use of teaching with technology and to reflect on the possibilities and limitations of IT in the classroom. First, the program requires training and reflection on matters of pedagogy—a question that the Provost's Office has been addressing for the past few years, with varying degrees of success. Second, the program emphasizes a sound theoretical approach to IT and pedagogy; it directs the individual to develop specialized IT tools for use in the classroom, particular to a given discipline, that the doctoral student can tout to potential employers. Third, the program enhances the acquisition of digital research skills, which will enhance students' scholarship during their tenure at the GC and beyond.

In brief, the certificate program is structured to provide participating doctoral students with the tools for theory, practice, and evaluation. First, two three-credit core courses provide students with an overview of history and theory and then pedagogy and practice, respectively. Second, in a series of short, noncredit workshops, students develop a new or improve upon an existing IT tool for the classroom. Third, students then choose from five three-credit independent studies options, each of which involves an independent reading with the Certificate Program Coordinator, structured to allow the student to put the final touches on the IT tool being designed and/or evaluated. (These courses are explained in "Curriculum" below.) Coincidentally, certificate program students are able to explore the realms of their discipline, IT, and pedagogy, and the program represents a significant step on behalf of the GC to provide pedagogical guidance and development to CUNY doctoral students.

Within the larger CUNY community, this program has the potential to have a significant impact on the education and IT literacy of thousands of CUNY's undergraduate students. A special population for this program is the pool of CUNY doctoral students who also serve as adjunct lecturers and Graduate Teaching Fellows across the CUNY system. As GC students enrolled in the certificate program develop IT tools and utilize them in their own CUNY classrooms, CUNY undergraduates in numerous disciplines across the system will benefit from being exposed to well-conceived IT tools. Within and beyond CUNY, this program opens the door to promote The Graduate Center as one of New York's centers for IT and pedagogy development. In addition to ongoing workshops for high school educators, led by staff of the GC's Center for Media and Learning, the certificate program could be extended as a resource to a much broader population, using its own graduates to lead the way. In a few years, with the appropriate resources, the GC could promote Continuing Education and Professional Development summer workshops on IT and pedagogy for primary and secondary educators, using students in the certificate program to lead a number of the smaller workshops. Put another way: the resonance of IT mastery and knowledge, beginning with this certificate program, could help shape the general design of IT and pedagogy across the city.

Several local private universities have developed IT initiatives that address IT questions in parallel but different ways. At Columbia, the Institute for Learning Technologies, founded in 1986, advances the role of computers and other information technologies in education and society, and its staff seeks to develop sound education policy and reform. They also develop IT titles and models, as part of their effort to "create sophisticated learning environments (according to their Web site)," primarily in local high school classrooms. At New York University, work on IT and the university happens at three levels. First, the Information Technology Institute (ITI) offers a number of on-line degree options, particularly in the field of business and continuing education. The ITI provides on-line courses, but it does not teach professors or graduate students how to teach courses that involve IT. Second, the Center for Advanced Technology (CAT) is a "focal point for partnerships among NYU faculty, the wider academic community, nonprofit organizations, and leading members of industry." It focuses primarily on title development for the market and business strategies for media

products, rather than on IT and pedagogy per se. Third, the NYU Interactive Telecommunications Program (ITP), in the Tisch School of the Arts, focuses on teaching "the concepts underlying new telecommunications and multimedia technologies."[vii] Course descriptions for the ITP M.A. program reveal an orientation to training new-media producers; questions of theory and pedagogy are not a central part of the project.

In brief, present IT activity in the metropolitan area is focused in three areas: title development (NYU's CAT and ITP), distance learning (NYU's ITI), and the design of constructivist learning centers primarily in local, underprivileged high schools (Columbia's ILT). With a new certificate program, The Graduate Center could become a locus of IT activity for secondary and postsecondary educators across the city.

The proposed Certificate Program in ITP offers a program for doctoral students that examines IT in its historical complexity, with a focus on the classroom, not the marketplace. Program coursework situates IT in a larger history of technology and education, and it investigates the pedagogical possibilities and the limitations of using IT in the classroom. In addition, it is the only program that links thinking about IT to a Ph.D. education in a particular discipline. In doing so, it creates two things. First, we have the opportunity to offer a vital service to the doctoral students at The Graduate Center and, as a result, potentially to thousands of students at the other CUNY campuses who these doctoral students teach every semester. Second, the proposed program lays the groundwork to build a constellation of IT-using educators and programs within CUNY and beyond. The Graduate Center's Center for Media and Learning has developed a national reputation for its workshops on IT and education. With its ongoing "New Media Classroom: Narrative, Inquiry, and Technology in the U.S. History Survey," high school and college educators are brought together to explore the integration of print and electronic media and to promote new strategies for teaching, particularly in the humanities. In seven locations across the country, small groups of educators participate in different workshops to address IT problems and possibilities and, through threaded discussions on the Web, build a "national conversation" about teaching and technology. Through GC and outside sponsorship, this conference could become a multidisciplinary event, with program students as a featured mainstay. Once doctoral students establish a certain mastery over IT

classroom tools, they could lead workshops showcasing what they have learned and what they have developed. (For more details, see "Curriculum," below.)

The ITP Certificate Program would complement nicely the GC's commitment to its doctoral students to provide unique opportunities for interdisciplinary study, as well as address the absence of formal structures for pedagogical training and reflection in many GC Ph.D. programs. This program creates the opportunity for team-taught graduate seminars, drawing on a variety of disciplines, and it encourages students to borrow concepts and methods from other disciplines to inform their research and instruction in their respective fields. Questions pertaining to IT and pedagogy have been raised, in various forms, in courses offered at the GC over the past five years. The proposed program offers a structured forum for doctoral students to raise questions about teaching that extend beyond their particular disciplines, and to consider how IT tools would help clarify or confuse certain teaching strategies and approaches.

BENEFITS TO DOCTORAL STUDENTS

The Certificate Program in Interactive Technology and Pedagogy is an especially compatible course of study for students in many doctoral programs within the humanities and social sciences, and can be readily pursued by candidates in the physical and natural sciences as well. Accordingly, the potential pool of students is sizable, and we expect the considerable interest in IT at the GC at this time to attract current and incoming students at a steady rate.

<u>Percent of graduate student respondents wanting more training in</u>:

Catalogs and databases	59%	Spreadsheets	29%
Statistical packages	50	E-mail	21
Web search engines	42	List management	10
Graphic design	32	Music composition	5

A 1998–99 survey of GC doctoral students, conducted by the President's Task Force on Information Technology, for which over 200 surveys were returned, revealed that a large number of GC students currently work with IT in their teaching and research. Most of the survey respondents

were Levels I and II doctoral students (that is, students still engaged in doctoral course work); 81 percent of the adjunct professors included in the sample used e-mail with their students, and 62 percent of them used IT in their teaching. The specific forms of IT were not listed, but interest is high in IT training for the classroom. Ninety percent of respondents indicated interest in learning more about IT, and 42 percent indicated interest in building skills with authoring programs. Other figures are noted in the table above.

We expect enrollment in the Certificate Program in Interactive Technology and Pedagogy to start slowly and to grow structurally and organically. The Office of the Associate Provost for Instructional Technology and External Programs has suggested a technology-oriented variation on the GTF award—the Graduate Teaching and Technology Fellow (GTTF), for which the recipient will receive reduced course load assignments in exchange for enrolling in the program and developing IT tools for the classroom. Again: the CUNY community *writ large* is expected to benefit from locally developed IT classroom tools, as tool development will utilize a flexible design structure, so that IT tools may survive beyond the end of a given semester. With little reworking, an IT tool designed for a required course on classical theory in Sociology, for example, should remain pertinent in successive semesters, regardless of the instructor or, for that matter, the campus.

The attractiveness of this program stems from its linking of technology and pedagogy. The first core course complies with elective requirements for most disciplines in the humanities and social sciences; the second core course extends theories and models from Sociology, Environmental Psychology, and Cognitive Psychology. Elective workshops will be day-long courses that will give students the opportunity to develop concrete skills in using computer-based applications.

ADMISSION REQUIREMENTS AND ENROLLMENT PROJECTIONS

As noted above, the program is limited to Ph.D. students enrolled at the GC, and it focuses on students in good standing at Level I or II of their doctoral study. (Level III students are eligible as well, but, for the independent study, they will most likely be limited to Options 3 and 5.) It is best suited to students who are teaching (or planning to teach); Graduate Teaching Fellows (GTFs) and

CUNY adjunct lecturers (in that order) will be given priority for class enrollment. The program might also involve Writing Fellows and Science Fellows, who are already involved in thinking critically about writing, research, and pedagogy. Like the GTFs, these Fellows may also be able to coordinate involvement in the certificate program as part of their general work assignment. Initially, interested students will need to confer with the Certificate Program Coordinator to secure admission. When demand exceeds available resources, evaluation for admission will be based on the following measures: a statement of purpose, grade-point average, and a letter of recommendation from a faculty member in the applicant's program. No specific prerequisites are required for admission to the certificate program, but students will be expected to be familiar with the use of Web browsers and search engines, Microsoft Windows and the Microsoft Office suite, and the general operations of hypertext markup language (HTML). No programming experience is required, however.

The Certificate Program Coordinator will serve as academic adviser for students in the program. The Coordinator will help students outline their courses and anticipated completion calendar, develop project ideas, and monitor the students' progress in the program.

At this time, the GC has no comparable course of study from which to project enrollment figures. Based on the anticipated rise in technological savvy and interest of incoming graduate classes, we offer the projections shown below. The figures, outlined by row, anticipate the number of students enrolling in the program each year, and a first-year attrition rate that decreases by half over the course of four years. These figures were compiled based on the retention and attrition rates of the other GC certificate programs.[viii] We anticipate a slightly reduced attrition rate, after the first year, as the GTTF students would have considerable incentive to complete the program. In terms of course enrollments, we anticipate students who are not interested in the overall certificate program may be interested in taking either the core courses, the electives, or both. A majority of the President's Task Force survey respondents indicated that computer experience and knowledge are indispensable skills in nearly every discipline.

<div align="center">Enrollment Projections</div>

	2001-02	2002-03	2003-04	2004-05	2005-06
1st entering group	8	5	4		
2nd entering group		10	8	7	
3rd entering group			15	12	10
4th entering group				22	18
5th entering group					24
Total Program Students	8	15	27	41	52

Unlike other less structured IT workshops popular at this time, this program provides students with the resources to think critically about IT as a possible solution to various pedagogical matters, rather than simply making practical skills and tools available without further guidance.

CURRICULUM AND COURSE DESCRIPTIONS

The Certificate Program in Interactive Technology and Pedagogy is designed to provide doctoral students with the tools for the conceptualization, development, and evaluation of IT usage in college classrooms. The GC currently offers a number of courses that focus on the history and politics of technology, but it lacks a method by which doctoral students can pursue theoretical <u>and</u> practical questions of interactive technology and pedagogy, and to think critically and constructively about the art and practice of teaching. In addition, many of CUNY's senior colleges are not equipped to offer part-time faculty (CUNY doctoral students doing adjunct or GTF teaching) the material resources or necessary technical personnel to develop IT tools for classroom use. Although IT technical support at the GC has been limited in the past, the wide availability of computer hardware and software throughout the new GC building and the recent expansion of the GC's New Media Lab make it possible to contemplate the future development of IT software programs.

The certificate program will provide students with a critical introduction to the constellation of science, technology, and everyday life, as well as encourage them to think critically about the presence of IT in the classroom. The program will also explore the pedagogical implications of interactive technology; it will advance students' skills as creators and users of technology-based

educational tools and resources and better prepare them for the changing requirements of academic employment. While students will learn about and experiment with new software applications, the program will move beyond functional technology training to generate a rigorous dialogue about pedagogy in the new-media classroom.

The sequence of courses—which can be completed by students in two years and total nine doctoral degree credits—is designed to provide a variety of historical, theoretical, political, and practical approaches to the connection between IT and pedagogy. The ITP Certificate Program relies on an interdisciplinary approach to the question of IT and pedagogy—a question that leads us to pursue solutions applicable to the humanities, the social sciences, and the physical and natural sciences. First, two three-credit core courses provide students with an overview of history and theory, and pedagogy and practice, respectively. Second, in a series of noncredit workshops, students will master relevant technical software and IT-design skills that will allow them to develop a new or rigorously evaluate an existing IT tool for classroom use; a minimum of three such noncredit workshops must be taken by students to complete and receive the ITP certificate. Third, students select from one of four possibilities for a three-credit independent study course, which will provide them with the opportunity to reflect on and evaluate the effectiveness in practice of the IT tool they create or evaluate. This design represents an effort to provide some pedagogical guidance and development by appropriate doctoral faculty for individual GC students enrolled in the program.

Doctoral faculty members who have agreed to participate in the Certificate program (their resumes are appended) include:

- William Kornblum (Sociology, GC)

- Ned Benton (Criminal Justice, GC & John Jay)

- Ron Birke (Chemistry, GC & CCNY)

- Stephen Brier and Jay Lemke (Urban Education, GC)

- Patricia Clough (Sociology, GC)

- Stuart Ewen (History and Sociology, GC; Film and Media Studies, Hunter)

- Joan Greenbaum (Environmental Psychology, GC & LaGuardia)

- David Greetham and Gerhard Joseph (English, GC)

- David Jaffee (History, GC & CCNY)

- Jeffrey Osleeb (Earth and Environmental Sciences, GC)

- George Otte (English, GC & Baruch)

- Dean Savage (Sociology, GC & Queens)

- Brian Schwartz (Physics, GC & Brooklyn)

- Christa Spreizer (Modern Languages, GC & Queens)

Participating doctoral faculty have been selected to teach in the certificate program based on a combination of:

- intellectual engagement with and/or scholarly publications in the larger theoretical and philosophical issues related to the impact of technology on society;

- experience in producing educational media materials for use in their respective fields and in their classrooms;

- experience in using computer based technology to teach undergraduate and graduate courses in their disciplines.

The sequence of requirements reveals how notions of the interconnection of pedagogy and technology inform the program and how these linkages offer rich and productive opportunities for thinking about instructional technology and for developing teaching strategies for implementing IT within and outside the classroom.

Core Courses

ITCP 70010, *Core Course on the History, Theory, and Practice of Interactive Media* (3 credits; 30 hours plus conferences; 6–10 students per offering):

Description: This course examines the history of interactive media, including its economic, social, and intellectual developments, to consider how links between science and technology shape the ways we think and act in the academy, in industry, and in everyday life. The course also examines the coinciding legacies of fascination with and ambivalence about technology, looking at notions of

technological determinism, in particular, to gauge the expansive impact of technology on pedagogy and education. In addition, this core course explores the history and theory of hypertext and new media, highlighting the theoretical and practical possibilities for research, reading, and writing in a world where new, nonlinear narrative structures are becoming the norm. The first part of the course employs readings in history and social theory to explore interactive technology as a subset of science and technology in the twentieth century. The second part of the course focuses attention on science, technology, and the classroom, exploring the support for (and opposition to) the complex coupling of technology and pedagogy. This course will also explore larger philosophical and political issues related to the equitable access to technology by traditionally underserved groups, the so-called digital divide. Final course requirements include an analytical research paper. The initial core course in the certificate program will be team-taught by a selected group of faculty members, drawn from a number of disciplines, including Sociology, History, English, Urban Education, and Psychology, as well as staff members of relevant research institutes and centers, including the Center for Media and Learning, the Center for the Advanced Study of Education, and the Stanton-Heiskell Center on Telecommunications Policy. Faculty will be members of the doctoral faculty except under specific circumstances as detailed in Section 6.2C of The Graduate Center's Governance Document. The Certificate Program Coordinator will coordinate the activities of the team of instructors that will teach this initial core course.

Rationale: All doctoral students enrolled in the ITP Certificate Program must take this first core course in order to build a solid theoretical understanding of the relationship between technology and education prior to immersing themselves in the more technical, production aspects of the program.

ITCP 70020, *Core Course on Interactive Technology and the University: Theory, Design, and Practice* (3 credits; 30 hours plus conferences; 6–10 students per offering):

Description: This second core course will introduce students to IT in the classroom, focusing on cognition and design. Interest areas include research in digital media; hypertext and narrative structure; visualization and design; modes of learning within and outside the classroom; and

conceptualization and production of educational media products. The course also provides a hands-on introduction to key educational uses of new-media applications, including on-line writing tools, electronic archives, and experimentation in virtual spaces. The class will meet frequently in GC computer classrooms. The course employs an interdisciplinary approach to the application of digital media to classroom teaching and scholarly research and presentations. Students will learn skills and concepts and then will design and prepare a multimedia-based project in their discipline, for their final grade. The second core course in the certificate program, like the first, will be team-taught by a selected group of doctoral faculty members, drawn from a number of disciplines, including Sociology, Criminal Justice, English, Urban Education, Chemistry, Physics, and Psychology, as well as staff members of relevant research institutes and centers, including the Center for Media and Learning and the Center for the Advanced Study of Education (again, appropriately appointed to teach at the GC. The Certificate Program Coordinator will coordinate the activities of the team of instructors that will teach the second core course.

Rationale: The second core course serves as the "content course" for the certificate. This course makes it possible for participating doctoral students to build on the theoretical insights gleaned in the first core course to begin to conceive and develop an IT project in their own disciplines.

Electives

Electives consist of workshops (a minimum of three must be taken to receive the certificate) that will focus on concepts as well as skills. These workshops are offered on a no-credit basis. The type and number of elective workshops a student selects will be based on nature of the student's project, necessary technical follow up on what was offered in the core courses, and development of particular technological skills applicable to the student's learning and teaching project. Selection of workshops should, ideally, reflect the direction of the student's developing IT project. Students should have a given project in mind that will eventually make its way into the classroom, as electives will allow students to sharpen their understanding of issues introduced in core courses. Essentially, workshops focus on building particular technological skills applicable to teaching and learning in particular disciplines. These noncredit electives will be offered by

doctoral and other CUNY faculty and, where appropriate, by advanced graduate students and non-university IT and media professionals.

CONCEPTUAL ELECTIVES

> The novice in the archives: Using on-line primary sources
>
> Challenges of assessment in the new-media classroom
>
> Economy of the sign: Visual communication in new media
>
> Information literacy: Tools for critical assessment of new-media source
>
> The electronic monograph: New media and scholarly research and publication
>
> New media, copyright, and the changing debate over intellectual property
>
> Multimedia, learning theory, and hypertextual thinking
>
> Student publishing on the Web: Students as creators in a public sphere
>
> Distance learning: the possibilities and problems inherent in the virtual classroom
>
> Hypertext and narrative structures
>
> Foundations of educational design

SKILLS-ORIENTED ELECTIVES

> Building your own and your students' Web sites
>
> Modeling/simulation—Building the virtual laboratory
>
> Using CUNY's Media Distribution System
>
> Constructing the electronic book using new multimedia tools (e.g., *TK3*)
>
> The Web-based researcher: Finding on-line resources for your dissertation
>
> Instructional design: Integrating new-media skill-building and resources into syllabi
>
> Using specialized software in the science classroom (e.g., HyperChem)
>
> Using specialized software in the humanities classroom (e.g., *Perseus* and *History Matters*)
>
> Effective creation and management of threaded discussions, listserves, and chat rooms

The Independent Study

The fourth requirement, ITCP 89010, the Independent Study (3 credits), can be pursued in four different ways, all of which privilege questions of pedagogy:

Description: In the independent study course—conducted under the supervision of the Certificate Program Coordinator, an appropriate faculty member, or professional designee—students will work directly to implement in the classroom the IT tools they designed in ITCP 70020 (the second core course) and the workshop electives. During ITCP 70020, students will find out (in conjunction with the GTF and other CUNY based teaching programs, when appropriate) about their teaching assignments for the subsequent semester. They will then be able to conceive and develop IT tools particular to the given course they will be teaching. Second, they will have the opportunity to put these tools into practice in their own classrooms. Third, they will draw from experience and a given set of readings to work with their supervisor to reflect on and—where possible—improve the inclusion of the developed IT tool in this independent study course.

In the near future, certificate program students will have developed a number of viable IT tools that can be used for instructional purposes. These tools will eventually become dated and need refurbishing and updating. A second independent study option allows students interested in extending and enhancing the design and development work completed by a previous student can, under the guidance of the Certificate Program Coordinator (or designee), update a given tool, if, for various reasons, the student's original IT project did not prove fruitful. The student will bring problems and successes to the attention of the Certificate Program Coordinator; together they will develop and work through a list of readings, focused on pedagogy and design, that will inform their revision of an existing IT tool.

The third independent study option has the capacity to offer a vital service to students at The Graduate Center, and to secondary and postsecondary educators across the city. To fulfill this Independent Studies requirement, under the guidance of the Coordinator or a designee, the student would develop and deliver a half-day workshop on IT and pedagogy designed for local educators. These workshops would be part of a larger GC outreach effort by its research centers and institutes to work with local educators to introduce IT solutions into primary and secondary classrooms around the city.

The fourth independent study option casts students in the role of technology ethnographers. IT in the classroom is still in its earliest stages. To gauge the effectiveness of IT tools, the certificate program has a cadre of evaluators in its own students. Students who choose this option would attend classroom IT presentations in CUNY colleges or in the public schools, talk to professors and teachers, follow students into the computer lab and interview them to gauge how well a particular instructor's hopes in using IT are translated into practice. Course requirements include periodic meetings with the Certificate Program Coordinator or designee.

All students enrolled in The Independent Study will be expected to complete a written self-evaluation that either assesses their implementation of their IT project in the classroom, or assesses their successes and failures in running IT workshops. Students who pursue the role of technology ethnographers will produce a final research paper based on their classroom evaluations. We also expect, after the certificate program is successfully launched, to allow ITP students to work in teams of two at various stages of the ITP certificate program. The program, the University, and doctoral students will all benefit from such cooperative efforts and approaches.

Rationale: All program students will complete the independent study in close consultation with a program faculty member or designee in order to fully demonstrate to their supervisor that the theoretical and technical lessons they've learned in the program have demonstrable application in classroom instruction, either through the student's own work as a classroom instructor or as an outside evaluator of someone else's IT practice. Written reports or research papers assure that students who successfully complete the certificate program are able to be self-critical and analytical in their uses of IT in addition to being technically proficient in the creation of IT tools.

Participating students will thus need to complete a nine-credit sequence to receive the certificate in interactive technology and pedagogy: six credits encompassing the two core courses; a series of no fewer than three no-credit conceptual and/or skills-oriented elective workshops; and a three-credit independent study.

PROGRAM ADMINISTRATION

The program will be developed and administered by the Associate Provost for Instructional Technology and External Programs under the direction of the Provost's Office. The Office of the Associate Provost will provide all necessary administrative support to the certificate program. The Associate Provost will serve as the interim Coordinator of the program; the GC President will solicit nominations and appoint a regular Coordinator within two years of the program's approval. The Certificate Program Coordinator would be a doctoral faculty member whose time would be compensated through the allocation system. The Office of the Associate Provost and/or the GC's New Media Lab will provide the primary workspace for program students to develop their IT projects.

An Advisory Committee will be established to govern the ITP Certificate Program. The Advisory Committee will be appointed by the President from among members of the doctoral faculty and other members of the GC staff where appropriate and who have expertise and experience in the area of interactive technology and pedagogy. The Advisory Committee will nominate to the President members of the initial certificate program faculty. Faculty will be members of the doctoral faculty except under specific circumstances as detailed in Section 6.2C of The Graduate Center's Governance Document. The Coordinator, in consultation with the Advisory Committee, will choose courses and faculty each semester, and, where appropriate, will supervise and coordinate team-taught courses that are offered. The Advisory Committee will propose a permanent governance structure for the program within two years of the formal approval of the certificate program. The Committee on Structure will forward this proposal with its recommendation to the Graduate Council for approval.

COST ASSESSMENT AND RESOURCES

We envision that the certificate program will require a changing combination of resources to meet the instructional needs of the two core courses; development and teaching of the one-day, no-credit workshops; supervision of certificate program students' independent study; and fulfillment of the necessary administrative duties of the program.

For the core courses, and possibly for many of the one-day workshops and for supervision of independent study, doctoral faculty will be drawn from existing Ph.D. programs, to be paid for through the standard CUNY allocation system. In addition, where appropriate, other, nondoctoral CUNY faculty from the campuses will be recruited to teach certificate program courses, with necessary reductions in their campus workloads to be paid for out of the allocation system. Finally, we will also look to particular CUNY Higher Education Officers (HEOs) with new-media skills to teach selected courses and workshops. HEOs have permission to teach one course per semester with an agreed upon reduction in workload and without additional monetary compensation.

For a number of the one-day workshops, we anticipate that we will need to attract appropriate instructors who work in the new-media and software industries to offer students the most effective training in cutting-edge technologies and applications. Assuming approval, in the program's initial year (the 2001–02 academic year) we expect to offer ten workshops that will necessitate the hiring of non-CUNY faculty, to be paid at the average rate of $500 per course. In subsequent years we expect to offer between 10 and 15 non-credit workshop courses each year.

The certificate program, at least for the first two years, will be administered out of the Office of the Associate Provost for Instructional Technology and External Programs, which will require a 20-hour per week college assistant (one half-time college assistant is currently assigned to the office) to support the administrative needs of the program. The college assistant will be responsible primarily for assisting with recruitment, scheduling of courses and rooms and necessary computer and audiovisual equipment, and necessary hardware and software purchasing. This college assistant position will require approximately $16,000 in tax-levy funds annually. By 2003–04 when we anticipate the program's substantial growth, the certificate program will probably require a full-time administrator. We expect this position to be an Assistant to HEO, at an annual salary of approximately $40,000. The program will require approximately $12,000 in start-up funding for purchase of four fully equipped Web and graphic computer workstations and accompanying software for use by certificate program students in developing their IT projects. The program will need to receive $4,000 annually thereafter to maintain, update and, where necessary, replace this hardware and software. Finally, the certificate program's resource library, along with other basic

OTPS purchases, will require a $5,000 annual budget. In total, the launch of the program will require a $38,000 budget; the second year of the program will require approximately $31,000; and in the third and out years, the budget rises to $56,500.

	2001-02	2002-03	2003-04	2004-05	2005-06
Personnel	$21,000	$22,000	$47,500	$47,500	$47,500
OTPS	17,000	9,000	9,000	9,000	9,000
TOTAL	**$38,000**	**$31,000**	**$56,500**	**$56,500**	**$56,500**

EVALUATION PROVISIONS

The Certificate Program in Interactive Technology and Pedagogy will develop its own internal mechanisms of evaluation in each of the first three years of the program. It will monitor enrollment figures and students' performance; keep tabs on the doctoral programs that serve as the primary feeders for program students; monitor student progress; evaluate student development of IT tools for classroom use; and track graduates in academe and beyond, checking their use of IT in the classroom (as well as in their nonacademic pursuits). The Associate Provost will provide these initial annual assessments. We think such ongoing assessment is important to determine the most effective courses and resources to offer. After the initial three years of the program, we will follow the standard practice of program review for GC certificate programs.

Notes

i "IT" variously stands for "instructional technology," "information technology," and "interactive technology." We use "interactive digital technology" to emphasize the new multimedia tools for educational use, as well as the flexible user-friendliness of texts delivered in nonlinear (i.e., hypertext) formats.

ii.   See www.wgu.edu/wgu/index.html, www.california.edu, and www.uophx.edu/online/, respectively, for more information on these programs. At www.ecollege.com, educators can utilize a number of digital tools for course accompaniment, and the students can coordinate obtaining on-line degrees from a number of different colleges.

iii.   See www.stanford.edu/group/STS/ and web.mit.edu/sts/, respectively, for information.

iv.   See muse.jhu.edu/journals/american_quarterly/asa.html for more information.

v.   See www.albany.edu/jmmh/ for more information.

vi.   See their home page at english-www.hss.cmu.edu/ for more information.

vii.   See www.nyu.edu/summer/tisch-itp.nyu and itp.tsoa.nyu.edu.

viii.   The other programs include, alphabetically, American Studies, Film Studies, Medieval Studies, Renaissance Studies, and Women's Studies.