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ABSTRACT

The New York Collaborative for Excellence in Teacher Preparation (NYCETP) is a project jointly undertaken by five college campuses of the City University of New York and New York University to enhance teacher education and to design and develop mathematics and science content and education courses for students preparing to be teachers. Over the first 3 years of the collaborative, the faculty development activities that involved cross-campus and cross-discipline collaboration occurred in large conferences, workshops, curriculum working groups, and through case studies. Formative evaluation has focused on facilitating faculty development, providing baseline data on courses, documenting change within the Collaborative courses, developing peer reviews of course documents, and to a lesser degree, assisting faculty in end-of-year course evaluations. Case studies of the Collaborative courses have been an important part of the ongoing evaluation, and an outline has been developed to guide faculty members in writing case studies. Evaluation of the CETP is important for both funders and evaluators. Both funders and evaluators are interested in careful review of project proposals and early warning systems for potential problems. Evaluators may have a more consultative function, but funders, who have responsibility to a broader constituency, may need to serve more as judges. Four appendixes contain a self-study guide, a related glossary, a campus peer review summary table, and the case study outline. (Contains 1 table and 26 references.) (SLD)

The New York Collaborative for Excellence in Teacher Preparation:

A Case Study of Context and Evaluation

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The New York Collaborative for Excellence in Teacher Preparation: A Case Study of Context and Evaluation

Introduction

Description of NYCETP

Description of NYCETP context. The New York Collaborative for Excellence in Teacher Preparation (NYCETP or "the Collaborative") is a project jointly undertaken by five college campuses of the City University of New York (CUNY) and New York University (NYU). The project is funded by the National Science Foundation (NSF), with additional support from the participating institutions. It is presently in its fourth year of a five-year grant. The main goals of the Collaborative to date include: (1) collaboration within and between the five campuses of CUNY and NYU; (2) faculty development emphasizing curriculum and teaching standards such as the National Council of Teachers of Mathematics (NCTM, 1989) and the National Research Council (NRC, 1996) Standards documents; and (3) the design and development of mathematics and science content and education courses for students preparing to become teachers. Although there are other important goals (e.g., recruitment of math and science teachers and increasing numbers of underrepresented populations within the teaching profession), these specific objectives form the basis for the Liberal Arts and Science course reform and programmatic change that are primary to the NSF CETPs' purpose.

The Collaborative includes colleges from a large public urban institution and a large private urban university. The five CUNY campuses are situated within four of

the five boroughs of New York City (Brooklyn College in Brooklyn, Lehman College in the Bronx, City College of New York and Hunter College in Manhattan, and the College of Staten Island on Staten Island), and NYU is located in Manhattan. Although each of these colleges is situated within New York City, they are located within vastly different areas of the city. Thus, the student bodies of each are quite different. Two of the CUNY campuses, Lehman College and City College are located in predominantly multiethnic areas, and Lehman College students are mostly second language learners. On the first New York State teacher licensure exam, the Liberal Arts and Sciences Test (LAST - Basic Skills; 1997), both of these colleges had a high percentage of failures. Brooklyn College and Hunter College also draw from a largely multiracial population; however, the students from these campuses performed much better on this indicator with over 80% of the education students passing the LAST on its first administration. The College of Staten Island is not an ethnically diverse campus. The college had a high rate of success on the LAST.

The student populations of CUNY and NYU vary considerably. While CUNY campuses draw almost solely from the New York area, NYU draws its student population from both the New York metropolitan area as well as nationwide. NYU is a selective private institution, and virtually 100% of its education students passed the LAST. The teacher education program at each of the participating universities is focused mainly on urban education.

The project director is a tenured faculty member on one of the CUNY

campuses and is one of six co-principal investigators (PIs). During the second year of the Collaborative, the director also served as the Dean of Education on her campus. Of the other PIs, one is a Dean of Education and the remainder are tenured faculty. Functionally, NYU, Hunter College and the College of Staten Island have two faculty members serving as co-PIs, one in the Arts and Sciences and one in Education. These individuals, all of whom manage their responsibilities on summer salary time and/or course release time, constitute the Executive Board, which oversees the activities of NYCETP. The project director holds primary fiscal and governance responsibility, supported by a full-time project coordinator and an administrative assistant. The co-PIs are responsible for the activities and involvement of the faculty on their campus, campus strategic planning, campus annual report data, coordinating recruitment, dissemination, and Collaborative-wide activities such as the Teaching Scholars program. The campus PIs are supported by one or two faculty members designated as campus coordinators.

Faculty development activities Year One. During the first year (1995-1996) of the Collaborative there were four faculty workshops and two larger conferences held at the different Collaborative institutions. These activities represented situations that brought faculty from various campuses together in a formal workshop or conference setting. The faculty workshops provided opportunities for faculty on each of the campuses to present activities taking place on their campus and thus served as a means for disseminating information related to project goals that were already underway at the time. Each of these workshops was attended by

between 20 and 30 faculty members from the six campuses. The two conferences held during the first year provided contexts for college faculty and administration, as well as public school teachers and administration, to learn about the integration of methods of teaching and content, in the first case, and the integration of technology and instruction, in the second case. Forty-six (out of 91) participants who attended the first conference completed a feedback survey, including 19 college faculty, four District Coordinators of Mathematics or Science, and 20 New York Public School teachers. There were 62 participants at the second conference including 34 college faculty, nine public school administrators, and 13 public school teachers.

In addition, during the spring and summer of the first year, the evaluators instituted faculty case studies. Faculty members from the various campuses were identified to study courses on other campuses that were proposed for revision the following year. These case studies were an attempt to directly facilitate the goals of the Collaborative, and to provide baseline data. Faculty members were identified to write the case studies and to be "case studied" with the goal of fostering interactions between individuals teaching similar courses at different institutions. This served both the goals of faculty development and evaluation.

Faculty development activities Year Two. During year two (1996-1997), the Collaborative members engaged in two faculty workshops, one conference, and began to meet as Curriculum Working Groups within specialty areas. The workshops focused on practical classroom topics such as the use of technology in

education and assessment issues, and were attended by less than 20 college faculty each. This attendance number was smaller than year one. The Curriculum (faculty) Working Groups were for elementary mathematics, elementary science, and secondary mathematics and science. They were formed to discuss course revisions, to provide feedback on course documentation, and, for the secondary group, to discuss issues of recruitment and retention. The faculty attendance ranged from a high of 29 (including PIs) in February 1997 to lows of 15 in April and 13 in May, 1997.

The large conference for the year was held at an informal science institution, the New York Hall of Science, "Mathematics and Science for All: How Informal Science-Rich Institutions Can Contribute to National Reform Efforts in Mathematics and Science." It was attended by 161 educators, 99 participants identified their affiliations, which included 47 public school teachers, seven public school administrators, 27 college faculty, four college students, and five museum personnel.

Four revised courses were "Case Studied" as in year one, and a peer review process for evaluating and providing feedback to course developers was used. This peer review was developed by the evaluators to function as an indicator of the quality of the revised courses with respect to the Collaborative goals.

Faculty development activities Year Three. The faculty development activities during year three (1997-1998) followed the pattern of the previous two years -- one conference, Curriculum Working Group meetings that continued the

peer review of course documentation, and three evaluation case studies. The annual conference was held at the American Museum of Natural History and focused on inquiry as teaching. The 42 participants included 22 public school teachers and 14 college faculty.

In summary, over the first three years, the faculty development activities that involved the cross-campus and cross-discipline (i.e., between Education and Liberal Arts and Sciences faculty) collaboration occurred in the large conferences, workshops, curriculum working groups, and through the case studies. The sustained Collaborative interaction occurred for the PIs, who met frequently (i.e., at least monthly) in years one and two, and somewhat less frequently in year three. The PIs also met with an internal faculty advisory group four to six times per year, and an external advisory group one to two times per year. Thus, over all the project activities there is a stable core of approximately 20 faculty members at meetings and little cross-campus faculty interaction outside of these scheduled meetings.

Evaluators for NYCETP. During the first three years of the Collaborative, there were two internal evaluators and one external evaluation group on the NYCETP project. The internal evaluators are a faculty member and a doctoral student at the Graduate School and University Center, CUNY. The internal evaluation staff is funded by a $40,000 (direct costs) subcontract for the NYCETP formative, internal evaluation to the Center for Advanced Study in Education, a research and development center affiliated with the educational psychology doctoral program at the Graduate School. The NYCETP project budget also includes

annual funds of $25,000 for the external evaluation team, a function that has been filled by the Evaluation and Training Institute (ETI) for years two and three of the project.

Overall, the formative evaluator's role and relationship to the Collaborative is as a consultant providing feedback, documentation, and development of evaluation activities that directly support specific Collaborative goals, as with the Case Studies and the peer review process of courses. This has involved frequent interactions with the project coordinator (in addition to the PI) who consults on agendas for meetings, reactions to conferences, and strategies for focusing activities on the project goals. Thus, the evaluators' role has been atypical for a formative evaluator in reaching out and working with staff other than the PI. This atypical role has been taken on since the PI, with many outside responsibilities, lacks sufficient time to deal with details of running the project.

Typically, the evaluators attended the PI, Executive Board, and Internal Advisory Board meetings, workshops, conferences, curriculum group meetings, etc., and provided immediate feedback as appropriate. These comments focused on discrepancies between Collaborative goals and implementation of particular activities, and, after year one, the goals as emphasized by NSF and the NSF National Visiting Committee.

Evaluation Models/Theory Used

The governance structure of NYCETP and the diversity among and between the campuses and their faculties played an important role in developing evaluation

activities. The early (and continuing) evaluation focused on formative feedback and documentation of faculty development activities. However, by the end of Year One, the primary evaluation activities were explicitly designed to encourage and support the goals of collaboration and course revision. Following Weiss (1997) and Lipsey (1993, 1997), we focused on faculty and course change for theory-based evaluation activities and involved faculty in carrying out the activities to support use of the evaluation (Patton, 1997; Weiss, 1998). Although there were other evaluation activities such as the examination of student attitudes following a reformed course and surveys of student views of a specific course, the crucial evaluation strategies with respect to the fidelity of course reform were the faculty case studies and peer reviews for new, revised or to-be-revised courses.

Within non-experimental applied research contexts and particularly when educational reform is the object of evaluation, theory plays an important role in strengthening evaluations (Cook & Campbell, 1979; Lipsey, 1993). Cook and Campbell explicitly identify the issues of the construct validity of causes (treatments) as well as effects. The idea of construct validity of the treatment, the "black box" or treatment theory characterized by Lipsey, is that the causal analysis is "... strengthened by an explicit theory about the nature and details of the change mechanism through which the cause of interest is expected to produce the effect(s) of interest" (Lipsey, 1993, p. 6).

Current educational reform derives from changing perspectives on teaching and learning. The "black box" in the Collaborative's reform efforts is the classroom.

The NCTM (1989, 1991, 1995) and NRC (1996) Standards documents are based on theories of knowledge construction and instruction that can be broadly characterized as developmental and apprenticeship in their orientation (Farnham-Diggory, 1994) or constructivist, emergent and sociocultural (Cobb & Yackel, 1996). The roles of teacher and student, classroom interactions and tasks, and the nature of student outcomes are the focus of reform.

Similarly, the role of theories or models of evaluation are also under revision. For example, O'Sullivan (1995) examines the emerging roles of evaluation in science education reform, Frechtling (1995; Frechtling & Sharp, 1997) considers the strategies for non-traditional program evaluation, and others have archived reform projects through the use of case studies (Stake, et al., 1993; Trumbull, 1993a, 1993b). From these perspectives, evaluation efforts can serve to foster and shape reform efforts.

Thus, the formative evaluation practices of the NYCETP have been focused on facilitating faculty development, providing baseline data on courses, documenting change within the Collaborative courses, developing peer reviews of course documents, and, to a much lesser degree, assisting interested faculty in end of year course evaluations. Formative feedback has emphasized course development resources and substantive products. The faculty case studies were, and are, an effort to directly facilitate the goals of the Collaborative. That is, they were carried out to facilitate the attainment of the first two goals, fostering collaboration between faculty on different campuses and facilitating faculty

development. They were also developed to stimulate the Collaborative's efforts toward the third goal, development and/or revision of curriculum and classroom practice. Faculty members were identified to participate in the case studies with the goal of fostering interactions between faculty in the Liberal Arts and Sciences and Education. In conjunction with the case studies, NYCETP faculty members and evaluators began to "peer review" course documentation, an activity also intended to serve the goals of faculty development, faculty collaboration, and, to a limited degree, facilitate the development of course reform.

Evaluation Outcomes

The evaluation practices that have directly impacted course reform and which may help us to gauge the fidelity of course reform and the role of context include: (1) workshop and conference attendance and feedback; (2) product specifications for NYCETP course dissemination; (3) peer reviews of reformed courses; and (4) case studies of reformed courses. The latter two provide an in-depth view of the reformed courses that can be examined for the fidelity with which these courses adhere to the goals of the Collaborative and the national reform movements within mathematics and science education.

Workshop and conference feedback. For the first three years, the main NYCETP activities were workshops, conferences, and curriculum working groups. These activities were the Collaborative's faculty development program, providing forums for display, examination, and discussion related to particular courses and teaching techniques. They constituted an attempt to provide the participating

faculty with a sense of the reform movements and relevant pedagogical practices within the fields of mathematics and science.

Attendance at the Collaborative workshops has been limited and has not grown over the years of funding. Although these activities provided opportunities for individuals to meet other participants and to hear about their work, only approximately 20 faculty members attended these Collaborative efforts on a continuous basis. A secondary potential goal of these meetings would be to increase the numbers of faculty involved in the Collaborative. This did not occur.

Product specifications for NYCETP course dissemination. There were efforts during the first and second year to come to terms with what faculty who were paid to revise and/or develop courses should provide to the Collaborative. The issue about documentation of courses arose since institutionalization of reform is a concern. In the CUNY context many Liberal Arts and Science courses taken by future teachers are taught by adjunct instructors and rarely are there provisions for continuity. During the second year of the Collaborative, the evaluation team developed a draft, entitled "Product Specifications for NYCETP." The draft intended to suggest the necessary rationale and detail to help others, such as adjuncts, understand the nature of the revised course.

An ad hoc committee of the Internal Advisory Board was appointed to consider and revise this draft. The document was reduced from two pages to one and included the requirement that one or two class sessions from the course be detailed. (As an aside, feedback related to the case study process from several

faculty members stated that the expectations for the course revisions and development should have been clear before they started work. The product specifications were an attempt to provide faculty members with such expectations.) By the middle of year four there was no implementation of the revised course specifications, with two exceptions. In these two instances, the faculty used the course specifications in providing documentation to the Collaborative (a math course at one college and chemistry course at another). Distribution and use of course documents has not occurred.

There are, however, two main sources of data from which the evaluators can draw conclusions related to the fidelity of course reform. These are the peer review process and the case studies. In both of these evaluative activities faculty and evaluators directly provided feedback to the PIs and to the individuals revising the courses, feedback about the degree to which the courses, as documented, met the goals of the Collaborative.

Peer Review Process. The peer review process was undertaken to provide feedback to faculty revising and developing courses for NYCETP. Five main categories of ratings are provided to reflect the degree to which the course documents provide evidence of meeting specific criteria for: (1) student centered instruction; (2) explicit inclusion of the present Standards documents for Science and Mathematics; (3) course/materials minimum expectations; (4) evidence of effectiveness or student outcomes; and (5) NYCETP general objectives. The degree to which the individual courses met each of these goals was rated on a four-point

scale. The lowest score (1) reflects major problems with the document in this area. The highest score (4) reflects an excellent rating with respect to this category of goals. Each of the larger categories consists of several components (see Appendix A; NYCETP Guidelines for Self-Study of Course Documents/Curriculum).

These guidelines were used to review each course document by at least one faculty member or evaluator. Some courses have more than one rater. Where this occurred, we found inconsistencies in the ratings given. For example, there were four reviewers for one course. On several items (e.g., use of inquiry-based approach, focus on deep understanding of major concepts, and detailed content), two of the reviewers indicated that there was evidence that the items were present in the course document, and two of the raters indicated that the items were absent. Individual reviewers came to this process with different expectations or criteria about what constituted a "focus on deep understanding," for example. (As a result of earlier discussions, the evaluators produced a Glossary of Terms (Appendix B) to accompany the Peer Review Guidelines to help individual faculty better understand the terms used in the outline.)

The Campus Peer Review Summary Table (Appendix C) provided us with an overall rating for each category. The courses reviewed varied in the degree to which they met each of these goal categories. Overall, the course documents ranged from a mean rating of 1.75, indicating major and/or minor problems with the document, to a 3.45, indicating a good to excellent rating; one course received perfect ratings for each category. Out of the total of 13 courses reviewed, two

were rated unsatisfactory with mean scores across all categories of 1.75, four had minor problems (2.00 - 2.50), three were good (2.50 - 3.00), three courses were good to excellent (ratings greater than 3.00), and one was rated as excellent in all categories. Overall the ratings of the 13 course documents provide some indication that these courses are more student centered (e.g., more use of inquiry-based approaches, focus on deeper understanding, and/or an emphasis on problem solving and critical thinking).

Case studies of Collaborative courses. Tittle and Pape (1996) developed a framework to describe and classify procedures and instruments developed to measure reform in school mathematics and science classrooms. This framework is based on the classification of teacher and student activities and interactions in classroom processes. It emphasizes features of reform-based classrooms such as subject matter, classroom interactions, types of knowledge and cognitive processes, methods and procedures, and teacher knowledge and beliefs.

Drawing on this framework, a Case Study Outline was developed to provide faculty members with guidelines for writing the case studies. The case studies were developed through meetings with course faculty, campus visits and observations (if feasible), and examination of course documents. The case studies were initiated in year one, and we conducted a follow-up interview with each faculty member involved. These interviews lead to the revision of the outline and the final version (Appendix D) includes six broad areas of inquiry: (1) general overview and context; (2) students -- target population; (3) course revisions; (4)

new/revised course specifications (e.g., course syllabi, instructional activities and materials); (5) student outcomes and assessments; and (6) faculty roles. Year one case studies (1996) provided baseline data or information about the courses before revision as well as faculty practices and beliefs at that time. Year two and three (1997, 1998) case studies provided feedback to the faculty.

Year one case studies included six mathematics courses and one science course distributed among the six campuses. Seven faculty members from various campuses studied these courses. During year two, three science courses and one mathematics course were case studied by four faculty. One of the courses was an experimental course in mathematics and another one served as an example of a fully-developed course that was revised prior to the Collaborative. During spring 1998, three courses, a mathematics course, a physics course, and a technology-based science education course, were reviewed. One of the courses studied during year one as baseline data was examined again in year three when a different instructor taught the course. For some of these case studies there was a reciprocal arrangement (i.e., faculty from campus A studied a course at campus B and vice versa) and some faculty were involved with more than one case study. In other cases both a Liberal Arts and Sciences and a Teacher Education faculty member were involved in a single case study.

In all, a total of 15 case studies have been conducted. Each case study involved faculty from different campuses, and, typically, Liberal Arts and Science faculty and Teacher Education faculty. The in-depth examination of specific

courses by both the individual teaching the course and the faculty member who wrote the case study served as both a means of staff development and, for many, a vehicle through which the process of course revision was begun. That is, while the case studies provided baseline data related to the courses to be revised, they also resulted in faculty visiting other campuses with a specific goal and focusing their interactions and discussions on particular aspects of the curricula. These individuals later reported conversations related to teaching activities, to the selection of topics included in the particular courses, and to the assessment of student understandings and attainments, among others. In some instances, the case studies served to focus the course revisions more concretely across campuses.

The fidelity of course reform as evidenced by the faculty case studies. Review of the case studies documents yields findings similar to those for the peer review of Collaborative course documents. The majority of courses have made some progress toward meeting NCTM and NRC standards and a few are exemplary.

One course studied during 1998 was an education course. The case study describes the instructor's use of the major aspects of computer technology, and a syllabus and web links for the spring 1998 semester (URL: http//www.nyu.edu/classes/murfin/micro/index.html). Included on the web site are assignments on developing web pages, group projects, lesson plans, research paper or grant proposal, along with student accomplishments. The course includes "tool software"

as well as other instructional software and is required for undergraduate students in the mathematics and science teaching programs. The course has changed from its pre-1996 format (i.e., evaluation of software packages) to the present emphasis on the WWW and the availability of mathematics and science related sites. There is more evidence of links with the schools for this course. For example, one activity was specifically designed to involve students with a master teacher to develop an interactive, on-line science fair. Also, some students from this course have been involved in teaching a summer program on technology for high school students.

Another 1998 case study provides perspective on courses under development. The Mathematics course has been under revision at one College since the beginning of the collaborative. Yet the case studies from 1996 and 1998, and the course documentation, suggest that there is still no clear direction for the course, and its extension, a second Mathematics course. Both courses are required and are key courses for prospective students in the elementary education program at the College. The course is taught by several faculty in the Department of Mathematics, with little apparent agreement. The review also indicates no collaboration with other NYCETP campuses in the course development, although there is contact with the education faculty on the campus.

Overall, the case studies for the three years now provide several examples of course documentation or "products" for the Collaborative. Eliminating courses to be discontinued, duplicate case studies, and/or courses with unsatisfactory ratings,

there are a total of 8 case studies in which there is sufficient documentation to enable other faculty to consider adoption and/or adaptation.

Unanticipated outcomes of the case studies include the importance of the interactions in fostering collaboration between faculty members on different campuses and in developing their understanding of reform-based teaching and learning. Through in-depth visitations of the various campuses, such things as the facilities available and/or necessary to provide reform-based courses became clear to the faculty. One faculty member (in a Mathematics Department) reported that she was better prepared to provide a request for space and materials than she had been prior to writing the case study.

With respect to changes in the faculty member's thinking, many of the faculty reported that the case study process influenced their thinking related to the revision of their courses. The following were mentioned as changes due to participating in the case study: the incorporation of more computer graphics and simulations, an evaluation of the entrance requirements for particular courses, the need to increase collaboration among students and the use of manipulatives as integral parts of the course, and the need for greater coherence between math and math education courses. For some, the difficulty inherent in collaboratively revising courses (i.e., collaboration between Liberal Arts and Sciences faculty and Education faculty) became more apparent. These two groups of individuals typically come to the revision process from different perspectives. One professor wrote:

I am experiencing first hand how difficult it is to plan and tryout activities

with colleagues who are not committed to course revision that requires major change in principles of teaching - such as deciding to cover fewer topics in a course but covering them in more depth, or taking sufficient time for hands-on activities and follow-up discussion before moving to a lecture-discussion of materials. At one of the meetings I heard faculty speak of themselves as a biologist or chemist but not as educators, and this causes me much concern because it suggests that we are not beginning with the same goals and expectations for courses and instruction. Perhaps faculty at different ends of the continuum on such issues will each move closer to a middle position. on the positive side, I am happy with students' comments about tryout of some activities. The question is how do our efforts lead to substantive change in the actual courses - especially in content areas.

In summary, the use in evaluation of NYCETP faculty to conduct the case studies and to review course documents of new and revised courses served many of the goals of the Collaborative and focused the curriculum revisions during the following years of the project. The case study was reported to have served to strengthen one professor's commitment to the Collaborative efforts and increased the potential for collaboration with members on other campuses. Finally, the resulting discussions facilitated individual faculty member's course revisions, one of the main formative goals in the beginning stages of the Collaborative.

Critical Analysis of Evaluation Practices and Project Outcomes

There are many specific aspects of the NYCETP outcomes to date that can be identified; however, our focus here is on the fidelity of reforms of courses. First, on the positive side of the evaluation, from the perspective of the fidelity of course reforms and drawing on our earlier analyses of course documents, the peer review process, and the case study documents, there are 10 course documents for courses still being taught. Seven of these are exemplary and/or well-reviewed courses that match many of the goals of the national standards in mathematics and science. These evaluation practices did help to increase the number of available course documents and to focus attention on what was being done (or, in many instances, not done). The focus on course changes and the structures of the peer reviews and case studies emphasized important aspects of reform as it appears in classrooms. As Lipsey (1993, 1997) and Weiss (1997) have argued, we located a key mechanism of change in the classroom -- content, interaction processes, assessments, and so on. We viewed the attainment of reform classrooms as a pre-requisite to changing models of teaching and student outcomes, and, indeed, the original project proposal included a list of courses on each campus to be revised and a provisional schedule for revision.

Second, on the critical side of the evaluation, the case studies and peer review processes were put forward by the evaluators as a means of helping the project reach its goals, that is as an implementation strategy rather than purely an evaluation procedure. On three of the individual campuses there were sufficient

local reform initiatives that course revisions were initiated and continued to expand. This did not necessarily mean that the courses were sufficiently documented to be disseminated either on their own campuses or between campuses. Nor does it mean that course revisions initiated were always completed, since New York State and CUNY campus curriculum demands on both the Arts and Science and Education faculty make course reforms a moving target!

Also on the critical side, the project and the evaluation lacked focus on what in retrospect is an important key mechanism, as important as the classroom: faculty understanding and experiences related to changing classroom practice--that is, the faculty development process. There was continuous feedback to PIs from comments on the conference, workshop, and curriculum group meeting feedback surveys about the need for more depth in understanding of changes, of classroom models to view and/or observe, and so on. These comments were duly noted and emphasized to the PIs. The steps to take for faculty development were not clearly identified in the project proposal, and no direct approach to this problem was developed by the project. Limited approaches or steps were taken in some of the curriculum and working group meetings.

The needs and challenges in faculty development can be inferred from the existing literature on K-12 teacher professional development (e.g., Knapp, 1997; Fennema & Nelson, 1998). However, information about the programmatic processes, experiences, and time needed for change for college faculty is not well documented. The NSF CETP Guidelines for Reform (1998) contain a section on

faculty enhancement. This section does suggest three areas of activities: 1) mini-grants; 2) brown bag lunches, seminars, week-long topical workshops, and retreats; and 3) make sure faculty are familiar with the national standards. The effectiveness and context for their suggestions are not described.

There are some likely differences between pre- and post-secondary professional development or enhancement. Faculty members think about courses, not curricula, and the rewards for "excellence" in teaching are few. And, faculty in mathematics and science typically do not exhibit a curiosity about their students' growth and intellectual development and how their teaching may connect (or disconnect) with student learning in their own classes. Further, individual faculty who undertake revising their teaching and courses often are isolated in departments (in mathematics and science) where other faculty are resistant or uninterested in their teaching and its connection with student learning.

Implications and Generalizations

For evaluation practice. The immediate implications for evaluation practices from the NYCETP evaluation are in at least two areas. First, limitations of formative evaluation for performing the funder's role in strengthening or monitoring project staff, and second, recognition that the issue is more than just evaluation when formative/internal evaluators find themselves designing evaluation activities continually to fill in for project activities.

As mentioned early in our paper, a key aspect of any project functioning is located in the leadership/administrative staff. After the initial meetings of the PIs,

the evaluator met with the project director and discussed the type of knowledge needed by a senior staff member to support the project director, since the project director was only able to devote limited time to the project. Project leadership and infrastructure both in terms of time commitments and the knowledge base of personnel is a critical area about which evaluators and funders need to be more realistic. Evaluators and funders need to carefully examine the staffing structure especially in large-scale reform projects at the post-secondary level. Based on this CETP case study, the project leadership/administrative structures cannot be funded as typical university research projects, with faculty time allocations that are part-time.

Also, as mentioned earlier, the case studies and peer review processes were primarily evaluation responses to the need to enhance structure and direction for faculty who began to undertake course reforms, and the need to enhance the definition of faculty and project responsibility in course reforms. These evaluation activities attempted to augment project leadership and definitions of responsibilities. The "usual" procedures of independent faculty performing at their own pace and defining their own goals, as found in academic settings, was not a viable model for a project with time lines, due dates, and "product" goals. Continued feedback on these issues did not produce the optimum level of response by all involved in the project. Again, evaluators can provide technical assistance and consulting but cannot direct projects. The dilemma is not easily resolved. In

this project the evaluators had some positive contribution, but often not as much as was needed to bring the project to a higher standard.

For evaluation theory. From the standpoint of evaluation theory, the implications are less clear. One implication may be that the reliance on theory developed from evaluations on education at the K-12 level has some value, but lacks sufficient fit to post-secondary education to be useful given the context of academic settings in which the CETP are embedded. A second implication arises from the recent writings on systemic reform and logic models, as described in papers from the National Institute for Science Education Fourth Annual Forum on Evaluation of Systemic Reform (NISE, 1999). Although these again are primarily K-12 focused, the projects are larger and the evaluation issues have apparent overlap with the CETP projects and postsecondary reforms. The scope of the systemic projects has led evaluators to look toward modeling of systems and change (Ridgeway, 1998 as cited in Heck, 1999) and to logic models (Rog, 1994 as cited in Barley, 1999) as ways of integrating theory-driven evaluation with project activities. Bringing these ideas to the context of a six campus project and focusing on the project design/plan/activities and the key mechanisms of classroom and faculty professional development in teaching might have had some effect in focusing evaluation theory and practice more tightly on the project proposal, activities, and implementation. This might have enhanced interactions particularly with PIs and NSF.

For research on evaluation of post-secondary reform of teaching and curricula. From the NYCETP perspective, research is needed on the existing evaluations in post-secondary education and teacher preparation. The context of the CETPs, at least the NYCETP, indicates that the project leadership structures, the type and amount of faculty involvement (e.g., course release and summer salary), teaching rewards, and faculty role definitions may lead to different evaluation issues in post-secondary and K-12 evaluations. A systematic analysis of existing evaluations, contrasting similarities and differences in evaluation practice and outcomes, may be useful.

Implications for Funding Agencies

The implications for funding agencies are in the grant making and funding processes:

1. The requests for proposals;
2. The review process for proposals; and
3. The monitoring of grants.

The request for proposals. Based on the evaluation and project implementation of the NYCETP, problems can be identified early in the funding process. Requests for Proposals (RFPs) can be developed based on a review of existing information about similar projects and their evaluations. Funding agencies should commission reviews (externally if necessary) to examine the findings from evaluations and projects in the area of reform of teacher preparation programs and to draft critical summaries. These summaries can be used to inform future

applicants. These reviews would identify areas such as faculty development, and contrast characteristics of successful and unsuccessful projects, and their evaluations. Characteristics would include areas identified in this evaluation. For example, project leadership structure, the detail of planning, the program theory and logic/activities links, and so on. Such information would assist applicants and reviewers.

The review process for proposals. The review process should include projections of project likelihood of success, given the important characteristics identified for teacher preparation projects involving faculty. Budgets and time allocations should be critically judged in relation to staffing and the scope of proposed activities.

The monitoring of grants. If the proposal and review processes are more detailed and carefully described, as with flow charts and activities, identification of deadlines, etc., funders will have a means to make decisions about continuing funding. If proposals are requested for areas in which funders have little knowledge and the existing literature on an area is limited, such as faculty development in mathematics and the sciences, then smaller, more targeted proposals should be considered for funding. This strategy should be aimed at developing the information for larger scale projects. These smaller projects would be able to carry through the faculty development process, the change in courses (teaching and learning processes), and document changes in student outcomes. When there is a base of models that warrant application, larger projects can be developed.

In summary, both funders and evaluators have similar issues with the CETP. These involve careful review of project proposals with awareness of critical features that are a minimum for successful implementation, and use of early warning systems for detecting problems in individual projects. Evaluators and funders differ, however, in their final judgments. Where evaluators may serve less as judge and more as consultant (Century, 1999), funders ultimately have responsibilities to a broader constitutency and may need to serve more as judges.

References

Barley, Z. A. (1999, February). Tracking the theory of change: A moving target. Paper presented at the National Institute for Science Education Fourth Annual Forum, Washington, DC.

Century, J. R. (1999, February). Evaluators roles: Walking the line between judge and consultant. Paper presented at the National Institute for Science Education Fourth Annual Forum, Washington, DC.

Cobb, P., & Yackel, E. (1996). Constructivist, emergent, and sociocultural perspectives in the context of developmental research. Educational Psychologist, 31 (3-4), 175-190.

Cook, T. & Campbell, D. T. (1979). Quasi-experimentation: Design and analysis issues for field settings. Chicago, IL: Rand McNally.

Farnham-Diggory, S. (1994). Paradigms of knowledge and instruction. Review of Educational Research, 64, 463-477.

Fennema, E., & Nelson, B.S. (1997). Mathematics teachers in transition. Mahwah, NJ: L. ERIbaum.

Frechtling, J. A. (Ed.) (1995, January). Footprints: Strategies for non-traditional program evaluation. Rockville, MD: Westat.

Frechtling, J. A., & Sharp, L. (Eds.). (1997, August). User-friendly handbook for mixed method evaluations. Arlington, VA: National Science Foundation.

Heck, D. J. (1999, February). Understanding evaluation of systemic reform: Purposes and visions for evaluation. Paper presented at the National Institute for

Science Education Fourth Annual Forum, Washington, DC.

Knapp, M. S. (1997). Between systemic reforms and the mathematics and science classroom: The dynamics of innovation, implementation, and professional learning. Review of Educational Research, 67, 227-266.

Lipsey, M. W. (1993, Fall). Theory as method: Small theories of treatments. In L. B. Sechrest & A. G. Scott (Eds.), Understanding causes and generalizing about them. New Directions for Program Evaluation, 57, 5-25.

Lipsey, M. W. (1997, Winter). What can you build with thousands of bricks? In D. J. Rog & D. Fournier, (Eds.), Progress and future directions in evaluation. New Directions for Program Evaluation, 57, 5-25.

National Council of Teachers of Mathematics (1989). Curriculum and evaluation standards for school mathematics. Reston, VA: Author.

National Council of Teachers of Mathematics (1991). Professional standards for teaching mathematics. Reston, VA: Author.

National Council of Teachers of Mathematics (1995). Assessment standards for school mathematics. Reston, VA: Author.

National Institute for Science Education (1999, February). NISE Fourth Annual Forum, Evaluation of systemic reform in mathematics and science. Madison, WI: University of Wisconsin-Madison, Wisconsin Center for Education Research.

National Research Council (1996). National science education standards. Washington, DC: National Academy Press.

National Science Foundation (1998). NSF CETP Guidelines for reform. Washington, DC: Author.

O'Sullivan, R. G. (Ed.) (1995). Emerging roles of evaluation in science education reform [Special Issue]. New Directions for Program Evaluation, 65 (Spring).

Patton, M. Q. (1997). Utilization-focused evaluation (3rd ed.). Thousand Oaks, CA: Sage

Stake, R., Raths, J., St. John, M., Trumbull, D., Jenness, D., Foster, M., Denny, T., & Easley, J. (1993). Teacher preparation archives: Case studies of NSF-funded middle school science and mathematics teacher preparation projects. Urbana, IL: University of Illinois, College of Education.

Tittle, C. K., & Pape, S. J. (1996, April). A framework and classification of procedures for use in evaluation of mathematics and science teaching. In C. K. Tittle (Chair), Evaluating mathematics and science reform in school classrooms: The role of theories in frameworks for evaluation. Symposium conducted at the annual meeting of the American Educational Research Association, New York. (ERIC Document Reproduction Services No. ED 395 797)

Trumbull, D. (1993a). Boston University: Project PROMISE: Program for Middle School Science Education. In R. Stake, et al., (Eds.), Teacher preparation archives: Case studies of NSF-funded middle school science and mathematics teacher preparation projects (pp. 119-135). Urbana, IL: University of Illinois, College of Education.

Trumbull, D. (1993b). Conceptualizations of science and mathematics education in and for the middle schools. In R. Stake, et al., (Eds.), Teacher preparation archives: Case studies of NSF-funded middle school science and mathematics teacher preparation projects (pp. 119-135). Urbana, IL: University of Illinois, College of Education.

Weiss, C. H. (1997, Winter). Theory-based evaluation: Past, present and future. In D. J. Rog & D. Fournier (Eds.) Progress and future directions in evaluation, New Directions for Evaluation, 76. 44 - 55.

Weiss, C. H. (1998). Have we learned anything new about the use of evaluation? American Journal of Evaluation. 19(1). 21 -33.

Appendix A

NYCETP GUIDELINES FOR SELF-STUDY OF COURSE DOCUMENTS/CURRICULUM

The Guidelines for Self-Study have been prepared by the NYCETP. The Guidelines are intended to structure your review of the materials prepared for dissemination with Collaborative support. Ratings and WRITTEN COMMENTS are necessary. Both will serve as recommendations for dissemination or further revision of materials.

Reviewer Name/College:_____ Date:_____

Course number and title: _____

Faculty who revised course/College: _____

Self-Study for course curriculum and materials:

Use the Guidelines for Self-study to guide your review and ratings. Rate each course/curriculum package on the categories below. Your ratings need to be explained. ATTACH WRITTEN COMMENTS on your ratings to assist in the improvement of the materials.

1) Rate the individual items in each category: **CIRCLE ONE** 1 2 3 NA

1- Absent 2-Partially present 3- Present NA-Not Applicable

2) After you have rated all items, make an **OVERALL RATING** for the whole category: **CIRCLE ONE** 1 2 3 4

1-Major Problems 2-Minor Problems 3-Good 4-Excellent

***NOTE:** Terms followed by an asteriks are defined in the attached glassary of terms.

A. Meets Collaborative Student Centered Instructional Goals -- CIRCLE to indicate USE OF ANY OF THE FOLLOWING:

1 2 3 NA Use of inquiry-based approaches*
1 2 3 NA Opportunities for hands-on, experiential learning*
1 2 3 NA Focus on deep understanding of major concepts*
1 2 3 NA Emphasis on problem solving, critical thinking skills*
1 2 3 NA Use of collaborative learning groups*
1 2 3 NA Use of technology in effective ways
1 2 3 NA Incorporation of alternative assessment approaches*
1 2 3 NA OTHER (describe) _____

Student Centered Instructional Goals: OVERALL RATING 1 2 3 4

B. Meets Collaborative Course Content Goals -- CIRCLE to indicate USE OF ANY OF THE FOLLOWING:

1 2 3 NA National Council of Teachers of Mathematics -- Curriculum Standards
1 2 3 NA National Research Council -- National Science Education Standards
1 2 3 NA New York State Teacher Education test guidelines (LAST)
1 2 3 NA OTHER(describe) _____

Course Content Goals: **OVERALL RATING 1 2 3 4**

C. Meets Collaborative Course/Materials Minimum Expectations -- CIRCLE to indicate USE OF ANY OF THE FOLLOWING:

1 2 3 NA Detailed content (concepts, process skills & habits of mind*), including syllabus, objectives, topics, exercises, details of technology, readings, assignments
1 2 3 NA Details of pedagogy, including active learning instructional strategies*, desired student outcomes*, and traditional and/or alternative assessment techniques* to be used when teaching the course, typical classroom, supporting equipment, facilities
1 2 3 NA Detailed course context, including location of course in teacher education preparation/liberal arts and science requirements target audience -"typical" students and intended population
1 2 3 NA Descriptions of course preparation include involvement of master teachers, liberal A & S faculty, education faculty, field sites, city resources (formal & informal), teaching assistant preparation (training sessions/training manual)
1 2 3 NA Describes relation between course content topics and teacher preparation goals*
1 2 3 NA OTHER (describe) _____

Course/Materials Minimum Expectations: **OVERALL RATING 1 2 3 4**

D. Meets Collaborative Evidence of Effectiveness Goals -- CIRCLE to indicate evidence of each of the following:

MATHEMATICS &/OR SCIENCES

1 2 3 NA Conceptual knowledge/Understanding concepts
1 2 3 NA Problem solving (e.g., emphasis on processes - Math)
1 2 3 NA Theorizing and analyzing* (Sci)
1 2 3 NA Communicating (i.e., oral &/or written)
1 2 3 NA Using tools (e.g., protractor, calculator, etc.)
1 2 3 NA Knowledge of facts and skills/routine procedures
1 2 3 NA Investigating natural world* (Sci)
1 2 3 NA Making Connections (i.e., within subject, across subject, & to every day life -- Math)
1 2 3 NA Reasoning: Conjectures and proof (Math)
1 2 3 NA Habits of mind*

D. Meets Collaborative Evidence of Effectiveness Goals -- CIRCLE to indicate evidence of each of the following (continued):

STUDENT ATTITUDES/OTHER OUTCOMES

1	2	3	NA	Attitudes*
1	2	3	NA	Increasing interest
1	2	3	NA	Careers
1	2	3	NA	Safety* (Sci)
1	2	3	NA	Participation*

Evidence Of Effectiveness Goals: **OVERALL RATING: 1 2 3 4**

E. Evidence of NYCETP Objectives:

A	P	NA	Collaboration with other NYCETP campuses
A	P	NA	Alternative assessment methods
A	P	NA	Partnership of science/math faculty and education faculty
A	P	NA	Partnership of science/math faculty and K-12 teachers
A	P	NA	Incorporates the use of urban context (e.g., informal science and mathematics institutions)

F. Meets Collaborative Dissemination Goals:

A	P	NA	Printed copy	A	P	NA	Computer diskette
A	P	NA	Videotape	A	P	NA	Publisher-texts
A	P	NA	Web site	A	P	NA	Professional conference
A	P	NA	Professional journal				
A	P	NA	OTHER (describe) _____				

Dissemination Goals: **OVERALL RATING: 1 2 3 4**

Appendix B

NYCETP GUIDELINES FOR SELF-STUDY OF COURSE DOCUMENTS/CURRICULUM

GLOSSARY OF TERMS

Source: National Science Education Standards (National Research Council, 1996)

1. **Inquiry-based Approaches**: "Scientific inquiry refers to diverse ways in which scientists study the natural world and propose explanations based on the evidence derived from their work."

Inquiry: " . . . multifaceted activity that involves making observations; posing questions; examining books and other sources of information to see what is already know; planning investigations; reviewing what is already known in light of experimental evidence; using tools to gather, analyze, and interpret data; proposing answers, explanations, and predictions; and communicating the results."

"Emphasizing active science learning means shifting emphasis away from teachers presenting information and covering science topics. The perceived need to include all the topics, vocabulary, and information in textbooks is in direct conflict with the central goal of having students learn scientific knowledge with understanding." (p. 21)

2. **Experiential Learning**: "Use appropriate tools and techniques to gather , analyze, and interpret data. ... The use of tools and techniques, including mathematics, will be guided by the question asked and the investigations students design."

Abilities necessary to do scientific inquiry:

- "Identify questions that can be answered through scientific investigation."
- "Design and conduct a scientific investigation."
- "Use appropriate tools and techniques to gather, analyze, and interpret data."
- "Develop descriptions, explanations, predictions, and models using evidence."
- "Think critically and logically to make the relationships between evidence and explanations" (p. 145).

3. **Deep Understanding of Major Concepts**: Students should develop " . . . productive and insightful ways of thinking about and integrating a range of basic ideas that explain the natural and designed world."

"As a result of activities in grades K-12, all students should develop understanding and abilities aligned with the following concepts and processes:

- systems, order, and organization
- evidence, models, and explanation
- constancy, change, and measurement
- evolution and equilibrium
- form and function" (pp. 115-116).

4. Critical Thinking: "Thinking critically and logically to make the relationship between evidence and explanations."

"Thinking critically about evidence includes deciding what evidence should be used and accounting for anomalous data. Specifically, students should be able to review data from a simple experiment, summarize the data, and form a logical argument about the cause-and-effect relationships in the experiment." (p. 145)

5. Collaborative Learning Groups: Students should ". . . engage in problem solving, planning, decision making, and group discussions." (p. 20)

- "Using a collaborative group structure, teachers encourage interdependency among group members, assisting student to work together in small groups so that all participate in sharing data and in developing group reports."
- The teacher's role in these small and larger group interactions is to listen, encourage broad participation, and judge how to guide discussion -- determining ideas to follow, ideas to question, information to provide, and connections to make" (p. 36).

6. Alternative Assessment Approaches: "Rather than simply checking whether students have memorized certain items of information, new assessments probe for students understanding, reasoning, and use of that knowledge -- the skills that are developed through inquiry."

- "Besides conventional paper and pencil tests, assessments might include performances, portfolios, interviews, investigative reports, or written essays" (p. 6).
- "Teachers of science engage in ongoing assessment of their teaching and of student learning. In doing this, teachers use multiple methods and systematically gather data about student understanding and ability." (p. 37)

7. Habits of Mind: (TIMSS) - "curriculum encourages ways of scientific and mathmatical thinking such as openness, objectivity, tolerance of uncertainty, inventiveness, curiosity" (Robitaille et al., 1993, p. 84).

8. Active Learning Instructional Strategies: "Inquiry into authentic questions generated from student experiences is the central strategy for teaching science."

- "Teachers focus predominantly on real phenomena, in classrooms, outdoors, or in laboratory settings, where students are given investigations or guided toward fashioning investigations that are demanding but within their capabilities."
- " . . . teachers can take an inquiry approach as they guide students in acquiring and interpreting information from sources such as libraries, government documents, and computer databases -- or as they gather information from experts from industry, the community, and government."
- "Teachers of science guide and facilitate learning. In doing this, teachers
- Focus and support inquiries while interacting with students.
- Orchestrate discourse among students about scientific ideas.
- Challenge students to accept and share responsibility for their own learning.

- Recognize and respond to student diversity and encourage all students to participate fully in science learning.
- Encourage and model the skills of scientific inquiry, as well as the curiosity, openness to new ideas and data, and skepticism that characterize science." (p. 32)

9. **Desired Student Outcomes**: " What students learn is greatly influenced by how they are taught."
- "The actions of teachers are deeply influenced by their perceptions of science as an enterprise and as a subject to be taught and learned."
- "Student understanding is actively constructed through individual and social processes."
- "Actions of teachers are deeply influenced by their understanding of and relationships with students." (p. 28-9)
- "Select science content and adapt and design curricula to meet the interests, knowledge, understanding, abilities, an experiences of students."
- "Select teaching and assessment strategies that support the development of student understanding and nurture a community of science learners" (p. 30).

10. **Course Content Topics and Teacher Preparation Goals**: "Program Standard A: All elements of the K-12 science program must be consistent with the other National Science Education Standards and with one another and developed within and across grade levels to meet a clearly stated set of goals."
- "In an effective science program, a set of clear goals and expectations for students must be used to guide the design, implementation, and assessment of all elements of the science program."
- "Teaching practices need to be consistent with the goals and curriculum frameworks."
- "Assessment policies and practices should be aligned with the goals, student expectations, and curriculum frameworks" (p. 211).

11. **Theorizing, Analyzing, Investigate**: see the following: Inquiry, deep understanding of major concepts, critical thinking, experiential learning, active learning instructional strategies

12. **Investigating Natural World**: see the following: Inquiry, deep understanding of major concepts, critical thinking, experiential learning, active learning instructional strategies

13. **Attitudes**: "Teachers of science develop communities of science learners that reflect the intellectual rigor of scientific inquiry and the attitudes and social values conducive to science learning. In doing this, teachers
- Display and demand respect for the diverse ideas, skills, and experiences of all students.

- Enable students to have a significant voice in decisions about the content and context of their work and require students to take responsibility for the learning of all members of the community.
- Nurture collaboration among students.
- Structure and facilitate ongoing formal and informal discussion based on a shared understanding of rules of scientific discourse.
- Model and emphasize the skills, attitudes, and value of scientific inquiry." (pp. 45-6)
- "Teachers who are enthusiastic, interested, and who speak of the power and beauty of scientific understanding instill in their students some of those same attitudes." (p. 37)

14. Safety: "Ensure a safe working environment."
- "Teachers also teach students how to engage safely in investigations inside and outside the classroom." (p. 44)

15. Participation: "Challenge students to accept and share responsibility for their own learning."
- "Although open exploration is useful for students when they encounter new materials and phenomena, teachers need to intervene to focus and challenge the students, or the exploration might not lead to understanding."
- "Premature intervention deprives students of the opportunity to confront problems and find solutions, but intervention that occurs too late risks student frustration. Teachers must also decide when to challenge students to make sense of their experiences: at these points, students should be asked to explain, clarify, and critically examine and assess their work." (p. 36)
- "Orchestrate discourse among students about scientific ideas."
- "Recognize and respond to student diversity and encourage all students to participate fully in science learning."
- "Teachers monitor the participation of all students, carefully determining . . . if all members of a collaborative group are working with materials or if one student is making all the decisions. This monitoring can be particularly important in classes of diverse students, where social issues of status and authority can be a factor." (pp. 36-7)

Appendix C
Campus Peer Review Summary Table

				*Meets the indicated Collaborative Goals for ...					
Campus/Course**	Total Number Revised	No. of Peer Reviews Completed	Year of Case Study	Student Centered Instruction	Course Content (Standards Docs.)	Course/ Materials Expectations	Evidence of Effectiveness	NYCETP Objectives Overall	MEAN
College A	1								
Mathematics		2	1996/ 1998	4	2.75	3	2.75	2	2.9
College B	4								
Education		0	--						
Mathematics		1	1996	2	3	4	2	1	2.4
Chemistry		4	--	2.5	1	1.75	2.5	1	1.75
Biology		0	1997						
College C	3								
Astronomy		2	--	2.5	2	2	2	2	2.1
Mathematics		1	--	3	4	2	3	2	2.8
Chemistry		0	1996						
College D	5								
Mathematics		0	1997						
Mathematics		2	1996	3.5	2.25	2.5	2	1	2.25
Mathematics		0	--						
Mathematics		0	1996						
Physics		1	1998	4	--	3	3	--	3.33
College E	5								
Mathematics		1	1996	3	--	2	1	1	1.75
Physics		4	--	3.67	3	3.5	2	2	2.89
Education		1	--	3	1	3	3	1	2.2
Biology		0	--						
Chemistry		3	1997	4	--	3.5	--	2	3.17
College F	4								
Education		2	--	4	3.75	3.5	4	2	3.45
Education		0	1996						
Education		1	1998	4	4	4	4	4	4.00
Education		0	1997						
Mean Ratings all Courses				3.32	2.68	2.90	2.60	1.75	2.69

*Rating Key: (1) Major Problems; (2) Minor Problems; (3) Good; (4) Excellent. The ratings for the overall goals represent the mean of the individual ratings provided on the peer review forms.

** College names have been deleted and courses have been changed to generic subject areas for the purposes of reporting results in this paper.

Appendix D

NYCETP Year 3 Case Study Outline

Begin the case study with an introductory page that describes the special characteristics of this course relative to the NYCETP collaborative goals:

- Increased use of inquiry-based approaches.
- Opportunities for hands-on, experiential learning.
- Focus on deep understanding of major concepts.
- Increased use of technology in effective ways.
- Use of an "urban context."
- Incorporation of alternative assessment approaches.
- Partnership of science/mathematics faculty and education faculty.
- Partnership of science/mathematics faculty and K-12 teachers.

Use the following outline to guide your documentation of the Collaborative course. The goal of providing this outline is to attain similarity between the case studies on different campuses. Please use the categories and questions to guide your interviewing and writing. Collect all materials that are available for the course and that may be included to illustrate your case descriptions.

I. General Overview and Context:

1. Instructor's name, department, title/position, course relevant experience/education, years teaching this course.
2. Title of course, number of hours and credits.
3. Catalogue description, placement of course in sequence, required core courses or other prerequisites, required course or elective.
4. Typical number of sections offered per semester, description of faculty who teach sections other than interviewee (i.e., number and percentage full-time versus adjunct or part-time faculty, pertinent experience, etc.).
5. Entering requirements such as grade point average or score on a diagnostic assessment.
6. Organization or breakdown of hours for each class session or hours per week (i.e., lecture, recitation, and lab hours).
7. Brief description of institution, total enrollment size, characteristics of student body.

8. Brief history of course, evolution of course over time (prior to NYCETP revisions) and broad goals or circumstances for changes.

II. Students - Target Population:

1. Course enrollment size, intended population (level of students, i.e., first year, major, teacher education student, etc.),
2. Description of several "typical" students (i.e., age, gender, ethnicity, SES, background, likely career goals or major).

III. Course Revisions or Development as Part of NYCETP Activities:

1. Name(s) of college faculty who revised/developed the course as part of NYCETP efforts. Others who have helped planning or revising course(s)? Did members of the Liberal Arts faculty and the Education faculty collaborate on the revision or development of the course (describe collaborative efforts)?
2. Overview of new or revised course including characteristics specifically related to particular NYCETP goals.
3. When was the new or revised course offered for the first time (or when will it be offered)? Will it be offered again? When?
4. Differences between new/revised course and the course that was originally offered (e.g., how has course structure or allocation of class time changed, how are goals and expected outcomes different, etc.).
5. Does this course involve the collaboration of experienced or master teachers, school district coordinators or others? Are exemplary field sites (i.e., classroom observation or student-teaching sites) being developed in conjunction with the new or revised course? Describe the use of such sites.
6. How is the impact of revisions on prospective teachers being evaluated? Have additional revisions been planned as a result of such an evaluation of the revised course?
7. Plans for revision not yet implemented or fully developed. Do these plans include provisions for the recruitment of teachers?
8. How has revising or developing the course changed your (i.e., the faculty who revised the course) thinking related to learning and teaching?

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