



**YALE-NEW HAVEN  
TEACHERS INSTITUTE**

**Annual Report**

**2006**

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Teachers Institute

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The Yale-New Haven Teachers Institute is an educational partnership between Yale University and the New Haven Public Schools designed to strengthen teaching and learning in local schools and, by example and district assistance, in schools across the country. Through the Institute, Yale faculty members and school teachers work together in a collegial relationship. The Institute is also an interschool and interdisciplinary forum for teachers to collaborate on new curricula. Each participating teacher becomes an Institute Fellow and prepares a curriculum unit to be taught the following year. Teachers have primary responsibility for identifying the subjects the Institute addresses.

Since its inception in 1978, the Institute has been recognized repeatedly as a pioneering and successful model of university-school collaboration; in 1990 it became the first program of its type to be permanently endowed as a function of a university. In 1998 the Institute launched a National Demonstration Project to show that the approach it had taken for twenty years in New Haven could be tailored to establish similar university-school partnerships under different circumstances in other cities. Based on the success of that Project, in 2004 it announced the Yale National Initiative to strengthen teaching in public schools, a long-term endeavor to establish exemplary Teachers Institutes in states throughout the country.

For information about the Institute model, the National Initiative, or opportunities to support the Institute's Endowment, please contact:

James R. Vivian  
Director, Yale-New Haven Teachers Institute  
P.O. Box 203563 Yale Station  
Yale University  
New Haven, Connecticut 06520-3563  
phone: (203) 432-1080  
fax: (203) 432-1084  
electronic mail: [ynhti@yale.edu](mailto:ynhti@yale.edu)  
Web sites: <http://www.yale.edu/ynhti>  
<http://teachers.yale.edu>

# Contents

Highlights of the Report.....	1
Introduction.....	1
The Program in New Haven.....	4
The New Haven and National Web Sites.....	4
 The Program in New Haven.....	5
The Seminars and Curriculum Units.....	5
Photographing America: A Cultural History, 1840-1970.....	6
Latino Cultures and Communities.....	7
Postwar America, 1945-1960.....	9
Math in the Beauty and Realization of Architecture.....	11
Engineering in Modern Medicine.....	13
Anatomy and Art: How We See and Understand.....	14
The Process of Determining the Seminar Topics.....	16
The Fellows' Application and Admissions Process.....	17
The Fellows Who Were Accepted.....	22
Activities for Fellows.....	26
Rewards for Fellows.....	33
Relating Seminar Topics to Curriculum Units.....	39
Results for the Participants.....	42
Experiences of First- and Second-Year Teachers.....	46
Benefits for Students.....	50
Participants' Conclusions Overall.....	56
Electronic Resources and Assistance.....	59
Institute Centers for Curriculum and Professional Development.....	61
Preparation for the Program in 2007.....	65
Program Documentation and Evaluation.....	67
 The Institute and Initiative Web Sites.....	70
 Conclusion.....	77
 Appendix	
Committees and Councils of the Institute	
Fellows and Seminar Leaders of the Yale-New Haven Teachers Institute, 1978-2006	
Selected Bibliography	



# **HIGHLIGHTS OF THE REPORT**

## **Introduction**

During 2006 the Yale-New Haven Teachers Institute continued its New Haven program for the twenty-ninth year and carried out the Yale National Initiative to strengthen teaching in public schools, a long-term endeavor to establish up to 45 new Teachers Institutes throughout the United States.

From its beginning in 1978, the overall purpose of the Yale-New Haven Teachers Institute has been to strengthen teaching and learning in local schools and, by example, in schools across the country. The Institute places equal emphasis on teachers' increasing their knowledge of a subject and on their developing teaching strategies that will be effective with their students. New Haven represents a microcosm of urban public education in the United States. Eighty-seven percent of the students in the New Haven Public Schools are African American or Hispanic. Because of the high proportion of students eligible for a free or reduced-price lunch, the district now has a universal free lunch program for all students through eighth grade.

At the core of the program is a series of seminars on subjects in the humanities and the sciences. Topics are suggested by the teachers based on

what they think could enrich their classroom instruction. In the seminars, Yale faculty contribute their knowledge of a subject, while the New Haven teachers contribute their expertise in elementary and secondary school pedagogy, their understanding of the students they teach, and their grasp of what works in the crucible of the classroom. Successful completion of a seminar requires that, with guidance from the Yale faculty member, the teachers each write a curriculum unit to be used in their own classroom and to be shared with others. The units are disseminated throughout New Haven schools and, in certain schools, through Institute Centers for Curriculum and Professional Development. Both print and electronic publication make the units available for use or adaptation by other teachers in New Haven, and by teachers, students, and the wider public throughout this nation and indeed the world.

Teachers are treated as colleagues throughout the seminar process. Unlike conventional university or professional development courses, Institute seminars involve at their very center an exchange of ideas among teachers and Yale faculty members. This is noteworthy since the teachers admitted to seminars are not a highly selective group, but rather a cross-section of teachers in the system, most of whom, like their urban counterparts across the country, did not major in one or more of the subjects they teach. The Institute's approach assumes that urban public school teachers can engage in serious study of the field and can devise appropriate and effective curricula based on this study.

Through 2006, the Yale-New Haven Teachers Institute has offered 176 different seminars to 613 individual teachers, many of whom have participated for more than one year. (Please see Appendix for a list of the Fellows.) The seminars, meeting over a five-month period, combine the reading and discussion of selected texts (and often the study of selected objects or aspects of the local environment) with the writing of the curriculum units. Thus far, the teachers have created 1588 curriculum units. Over the years, a total of 93 Yale faculty members have participated in the Institute by giving one or more seminars. (Please see Appendix.) Of them, 65 have also given talks. Forty-four other Yale faculty members have also given talks. About half of these 137 participants are current or recently retired members of the faculty.

The Institute's twentieth year, 1997, had brought to a climax a period of intensive development of the local program. That had included placing all Institute resources online, providing computer assistance to the Fellows, correlating Institute-developed curriculum units with new school-district academic standards, establishing Institute Centers for Curriculum and Professional Development in the schools, and establishing summer Academies for New Haven students. In that year, while continuing to deepen its work in New Haven, the Institute began a major effort to demonstrate the efficacy of its approach in other cities across the country.

This effort involved in 1998 the planning stage of a National Demonstration Project. In 1999 partnerships were established between colleges or universities and school districts at four sites that planned to tailor the Institute's approach to local needs and resources. Implementation grants were awarded to four new Teachers Institutes — including Pittsburgh (Chatham College and Carnegie Mellon University) and Houston (University of Houston). These grants enabled them to work with the Yale-New Haven Teachers Institute for an initial period of three years, from 1999 through 2001.

In 2002-03 the Institute's work on the national level was notably assisted by an extension of the support for the National Demonstration Project which enabled the two-year Preparation Phase of the Yale National Initiative to be brought to completion. The Preparation Phase included Research and Planning Grants for the Pittsburgh Teachers Institute and the Houston Teachers Institute, which have significantly contributed to the evaluation of the Teachers Institute approach. The Preparation Phase enabled the Yale-New Haven Teachers Institute to collate and analyze data from the questionnaires and surveys conducted during the National Demonstration Project, establish a Web site for the Yale National Initiative, and prepare the "Understandings" and "Necessary Procedures" that serve as the basis for membership in a new League of Teachers Institutes. The Preparation Phase made possible a summary evaluation of the National Demonstration Project by Rogers M. Smith and other researchers at the University of Pennsylvania, and culminated in 2004 with the announcement of the Yale National Initiative to strengthen teaching in public schools in states throughout the country.

In 2005-06 ten cities in nine states began participating in the National Initiative. These included three cities that already had Teacher Institutes — New Haven, Houston, and Pittsburgh — and seven cities that the Initiative had targeted for their potential to establish a new Teachers Institute. Superintendents of public schools in these seven cities nominated teachers to become Yale National Fellows who would participate in national seminars led by faculty members experienced in the Institute approach. In this way teachers might learn first-hand about that approach and might become leaders in exploring the creation of a Teachers Institute for their home community. Although they meet on a compressed schedule, the national seminars have the same expectations as New Haven Institute seminars. In this way, the National Initiative undertook an annual series of activities: an Organizational Session of the seminars that National Fellows attend each May; an Intensive Session of seminars for two weeks each July, which Institute directors and college and university faculty members from participating cities also attend; and an Annual Conference each October where school officials learn more about the Institute approach from National Fellows, national seminar leaders, and other faculty.

## Annual Report: Highlights of the Report

The present report focuses on the activity undertaken by the Yale-New Haven Teachers Institute in 2006. Extensive material on the National Initiative is available on the Initiative Web site.

### The Program in New Haven

This section of the report covers the offerings, organization, and operation of the Institute's 2006 program for the New Haven teachers who participated as Fellows. It draws extensively upon the evaluations written by Fellows and seminar leaders at the conclusion of their participation. Here the report documents teacher interest in Institute seminars, as well as the content of the seminars that have been offered, the application and admissions process, the participants' experience in the program, and the preparation for 2007 offerings. It describes the maintaining of Institute Centers for Curriculum and Professional Development in several schools and the continuing involvement of new teachers as Fellows. It outlines the process of local documentation and evaluation.

We hope that this section of the report will be of interest to all those who assist in supporting, maintaining, and expanding the program in New Haven. We hope that its account of our local procedures may continue to prove useful to those who have established new Teachers Institutes, and to those in other communities who are contemplating the establishment of such Institutes.

### The New Haven and National Web Sites

The Web site of the Yale-New Haven Teachers Institute makes available electronic versions of the Institute's publications — including the volumes of curriculum units, reports and evaluations, essays and other materials concerning the Institute's work since 1978. (The address is <http://www.yale.edu/ynhti/>.) The Web site is valuable for New Haven teachers; it played a key role during the National Demonstration Project; and that role has grown as the Yale National Initiative proceeds. The Web location has been advertised prominently in the periodical *On Common Ground*, which contains articles regarding school-university partnerships and reaches a national audience. We estimate that from its inauguration in June 1998 through December 2006, this Web site has been visited by nearly six million different persons. Of these, more than one million visited during 2006, when the site registered some 7.5 million hits.

The Web site of the Yale National Initiative (the address for which is <http://teachers.yale.edu>) presents the curriculum units written by the Yale National Fellows who participate each year in national seminars; publications and video programs on the Teachers Institute approach; and news and other information about the Initiative and the League of Teachers Institutes. From the national Web site, teachers and others may search and comment on the curriculum units written in national, as well as local Teacher Institute, seminars.

## THE PROGRAM IN NEW HAVEN

### The Seminars and Curriculum Units

From its inception, a tenet of the Institute's approach has been to determine its offerings annually in response to the needs for further preparation and curriculum development that the teachers themselves identify. In 2006 this process, as described later in the report, resulted in the presentation of six seminars, three in the humanities and three in the sciences and mathematics. Teachers' participation in these seminars was greatly assisted by the annual contribution from the New Haven Public Schools.

With support from endowment income the Institute offered three seminars in the humanities:

"Photographing America: A Cultural History, 1840-1970,"

led by Alexander Nemerov, Professor of the History of Art and of American Studies

"Latino Cultures and Communities,"

led by Stephen J. Pitti, Professor of History and of American Studies

"Postwar America, 1945-1960,"

led by Cynthia E. Russett, Larned Professor of History

With support from the Sherman Fairchild Foundation and from the Howard Hughes Medical Institute grant to Yale, the Institute offered three seminars in the sciences and mathematics:

"Math in the Beauty and Realization of Architecture,"

led by Martin D. Gehner, Professor Emeritus of Architectural Engineering

"Engineering in Modern Medicine,"

led by W. Mark Saltzman, Goizueta Foundation Professor of Chemical and Biomedical Engineering

"Anatomy and Art: How We See and Understand,"

led by William B. Stewart, Associate Professor of Anatomy (Surgery)

The following overview of the work in the seminars is based on the descriptions circulated in advance by the seminar leaders, the introductions they wrote to the volume of curriculum units produced in their seminar, and the curriculum units themselves.

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## Photographing America: A Cultural History, 1840-1970

This seminar focused on how to use photographs actively in the classroom. The participants sought to go beyond using photographs as simple illustrations, and instead analyze the meaning and interpretation of photographs. The seminar looked at individual photographs, studying them for prolonged periods, having conversations about them, trying to determine how and why the photographer chose this particular subject; how the photographer "designs" that subject, through cropping, tonality, point of view, orchestrated luck, type of camera, and many other aspects of photography as a truly creative practice. Participants aimed to understand how photography does not so much copy the world but invents it, through the imagination and situation of the photographer.

Discussions sought to open up photography as a powerful medium for classroom instruction. Fellows agreed on ways to use it to teach the specifics of American history, political and cultural. Beyond that, they explored ways to use it to teach students, and themselves, how to speak and write about the world — how to summon the right language, how to become engaged thoughtfully with what they see.

The curriculum units embrace the teaching of reading, writing, history, and critical thinking. James Brochin, a high school teacher of history, focuses on war photography; his goal is to transform students' viewing of photographs, and perhaps even their viewing of the world, from observers to engaged witnesses. Stephen Broker, who teaches high school biology and Advanced Placement environmental science, wrote a unit relying on close analysis of nineteenth- and twentieth-century photographs to examine America's changing

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Michael Marsland

*The seminar on "Photographing America: A Cultural History, 1840-1970." (Left to right: Fellows Jacqueline E. Porter-Clinton, Malini Prabakar, and Sandra K. Friday.)*

perspectives on our natural heritage and how we choose to use natural resources. Jennifer Flood, a kindergarten teacher, addresses New Haven history through photographs. An English teacher of high school students who are at particular risk of dropping out, Sandra Friday invokes Gordon Parks' photography to sharpen students' visual skills, understanding, and communication skills as they interact with images from World War II through the Civil Rights Movement. Deborah Hare, who teaches high school English and journalism, also uses the work of Gordon Parks — along with that of Lewis Hine, Dorothea Lange, and Margaret Bourke-White — to teach "photojournalism for social change."

A teacher of third grade, Roberta Mazzucco aims to further writing instruction; her unit assumes that examining photos is one way to increase students' awareness of details and how point of view, whether of the writer or photographer, influences what an audience sees and feels. Michele Murzak's unit uses photographs of September 11, 2001 to teach fourth-grade students social studies as well as reading and writing. Working with middle-school students in special education, Jacqueline Porter-Clinton uses photographs to teach African American history. Writing instruction is the focus of Malini Prabakar, a sixth-grade teacher; her students will analyze various photographs and interpret them from different points of view, then communicate their thoughts and feelings in writing. Finally Kathleen Rende, who teaches a second-grade class of English language learners, will use photographs from the nineteenth century to the modern era to help her students develop critical thinking and evaluation skills as well as their social studies knowledge.

The seminar leader concluded that Fellows "explored the special power of talking about photographs (instead of merely showing them) to make the past come alive."

### Latino Cultures and Communities

This seminar examined the history and culture of Latinos in the United States since the mid-nineteenth century. Readings and discussions explored patterns of conquest, immigration, settlement, and political activism, as well as the rapid "Latinization" of the United States over the last thirty years. Much of the material addressed the cultural expressions of ethnic Mexicans, Puerto Ricans, and Cubans, although participants also explored other groups of Latinos and examined the ways that their histories have intersected with broader cultural and political currents in the hemisphere. Topics included the place of Latinos in U.S. schools and in Connecticut specifically, the relationships between Latinos and U.S.-Latin American relations, and changing representations of Latinos in U.S. literature, film, music, education, and social movements.

Fellows' curriculum units emerged in a time of national and international debate about Latinos, undocumented immigration, and the enforcement of national borders, as the spring 2006 seminar coincided both with

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*Fellows "explored the special power of talking about photographs (instead of merely showing them) to make the past come alive."*

*—Seminar Leader*

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Congressional efforts to reform immigration and with political demonstrations throughout the U.S. about immigrant rights. In this context, the Fellows worked to understand Latino history over the past century, they debated contemporary topics such as bilingual education and labor unionism, and they read the work of influential scholars, poets, and fiction writers who have attempted to represent Latino experiences. Participants grappled with the changes underway in the present day as well as the longstanding presence of Latinos in the United States. By crafting a diverse set of units related to U.S. communities of Latin American origin, and by taking on subjects ranging from music to food, muralism to civil rights, Fellows authored a collective response to conditions in the urban Northeast.

María Cardalliaguet Gómez-Málaga, a high-school teacher of Spanish, uses the Mexican and Chicano mural movements to foster students' language study as well as their knowledge of history and culture. A high-school teacher of English and literature, John Donahue probes Latino and American identity through fiction. Tina Pedrolini Caplan, who teaches middle-school social studies, employs oral history to teach students about immigration patterns in her school's neighborhood. Judith Goodrich, a middle-school teacher of history, focuses on civil rights struggles in the Latino community. A middle-school Spanish teacher, Diane Nichols uses cuisine as an angle for study of culture and language. Another teacher of middle-school Spanish, Alexandra Reyes applies music in a similar fashion. Diane Huot, teaching third grade, uses Latino literature as a "cultural springboard" for reading instruction. Waltrina Kirkland-Mullins, teaching language arts and social studies to second and third graders, provides students with a look at the intersections of West African,

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Michael Marsland

*The seminar on "Latino Cultures and Communities." (Left to right: Fellows Janet Priestley, John J. Donahue, Rosemary Little, Diane M. Huot, and María Cardalliaguet Gómez-Málaga; seminar leader Stephen J. Pitti; and Fellows Tina Pedrolini Caplan, Shannon E. Oneto, and Cortney R. Costa.)*

Puerto Rican, and Cuban cultures by way of the rhythm of the drum. Shannon Oneto, a first-grade teacher, uses holidays as a vehicle for language arts and culture instruction. And Cortney Costa, who likewise works in a dual-language setting, applies a particular work of Latino fiction to teach fourth-grade students literature, reading, and writing.

Noting Fellows' "engagement with important issues," the seminar leader said, "if their work suggests only a fraction of the countless topics that might have developed under the rubric of 'Latino cultures and communities' . . . theirs is an impressive fraction, an exciting set of units which respond to the growing number of Latino students in local classrooms." He concluded of the units, "Each offers a stimulating guide for thinking about the place of Latin Americans in this country, and each in its own way represents a response to the changing nature of twenty-first century Connecticut."

### Postwar America, 1945-1960

Historians until recently often overlooked the period in American history just after World War II as they focused on the more obviously tumultuous decade of the 1960s. Yet, as this seminar underscored, in retrospect many of the social developments that peaked in the 1960s actually had their roots in the 1950s. After the war suburbs proliferated, and returning veterans and their wives, with help from the federal government through easy financing, flocked to them to begin their new lives as suburban dwellers. The economy soared, in part through the purchase of consumer durables to fill these new homes. Babies were born in record numbers, a further stimulus to the economy.

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*This seminar recognized that beneath the surface harmony and good times were strong social currents.*

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The seminar on "Postwar America: 1945-1960." (Left to right: seminar leader Cynthia E. Russett and Fellows Mary Lou Narowski, David Reynolds, and Kevin Inge.)

This seminar recognized that beneath the surface harmony and good times were strong social currents. Racial injustice was brought to light in the landmark Supreme Court decision *Brown v. Board of Education of Topeka*. African Americans had by no means been complacent about their place in the social fabric, but now their organized protests and the civil rights movement more fully emerged.

Other groups, too, began to chafe against social constraints. Young people listened to Beat writers like Allen Ginsberg and Jack Kerouac and decided that their own lives as the children of the middle class were boring and lack-luster. The Beat movement proclaimed that material goods could be set aside in the search for authenticity and what Kerouac referred to as "IT," thus laying the groundwork for the counterculture that emerged to the consternation of parents in the 1960s. And women in their suburban homes began to feel the discontent that Betty Friedan was to document.

During the 1950s the Cold War's repercussions were felt in a fear of subversion that led to McCarthyism. We now know that Soviet spies were indeed at work in this country, but McCarthy went far beyond any evidence to charge hundreds of people, almost all entirely innocent, with subversion.

Fellows' curriculum units addressed this among many other topics. Joseph Corsetti considers "McCarthy v. Murrow," challenging his high-school history students to think about different political systems and their consequences, and to evaluate, through a mock trial, the evidence McCarthy presented to support his charges. Ascertaining truth also absorbed two other units. David Reynolds, a high-school teacher of English, examines the work of the so-called "New Journalists" of the 1960s. At the middle school level, Crecia Swaim looks at the work of the documentary photographer Dorothea Lange and alternative records of reality. Targeting fourth graders developing literacy skills while studying history, Christine Elmore focuses on three individuals of the period whom she sees as agents of change — Elvis Presley, Malcolm X, and Rachel Carson.

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*These units bring to life a period in American history still alive in the memories of students' grandparents, but almost completely unknown to today's students.*

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Sean Griffin, recognizing the attraction of fast-paced and active reading to win his students over to poetry, introduces his middle-school English students to some of the protest poetry of the 1950s and 1960s and then asks them to participate in a poetry slam as a final project. A high-school teacher of English, Kristen Grandfield looks to ancient Greek rhetoric for inspiration to coach her students in persuasive writing, using as models famous speeches of the 1950s and 1960s. A teacher of English at the middle-school level, Mary Lou Narowski calls on each of her students to choose one year from the decade of the 1950s and develop for that year a complete newspaper with as many of the features of a regular newspaper as possible.

Fellows in this seminar found their richest source in the civil rights movement. Lucia Rafala, a library media specialist in an elementary school, begins

her unit in the time of slavery and moves forward to the 1960s on what she called "The Road to Equality." Teaching English and social studies in the middle grades, Kevin Inge uses the work of Dr. Martin Luther King to emphasize the ways in which his life and work can teach students important lessons in leadership. Joanne Pompano, a teacher of the blind and visually impaired, examines the early beginnings of the disability rights movement, which drew energy from veterans with disabling war wounds from World War II.

The seminar leader observed, "Taken together, these units bring to life a period in American history still alive in the memories of students' grandparents, but almost completely unknown to today's elementary and high school students."

### Math in the Beauty and Realization of Architecture

This seminar focused on architecture to foster the teaching of mathematics. The premise was that architecture is a profession where the arts and sciences fuse to create environments for human habitation. The inclusion of a project to design and construct a model provided each Fellow an opportunity to experience how making things encourages learning. As the seminar leader envisioned the seminar, natural resources form the basis for people to create environments. The processes for designing and constructing objects, buildings, or environments demand applied knowledge, including of mathematics. Beauty rises from the embrace of the visual delight, the perfection of function, and the efficiency of operation for the intended purpose. Architects may experiment with design, with material, and with construction methods to bring beauty to the design process.

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*This seminar focused on architecture to foster the teaching of mathematics.*

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Michael Marsland

*The seminar on "Math in the Beauty and Realization of Architecture." (Left to right: Fellow Pedro Mendia-Landa and seminar leader Martin D. Gehner.)*

The seminar explored how the natural environment not only provides the materials for projects, it also provides the sources for variations of structural geometries, light, thermal, olfactory, audio, tactile, air flow, and material durability. Physical and mechanical properties of each material are important. How material pieces are formed, cut, molded and connected provides the designer with critical information. The size, strength, stability, and durability of each architectonic piece depend on the translation of basic data into realistic form and performance requirements. Movement, rhythm, repetition, vibration all emerge from the material, the relationships, and the connectivity of abstract ideas to real objects. Even music, the seminar leader posited, is composed with beauty firmly anchored in human understanding of composition and applied mathematics. Historical precedents exist as illustrations of thoughtful achievements to learn about successes and failures in our built environment. Historical, and cultural, examples inform design processes in the search for new forms, materials and applications.

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*This seminar's resulting curriculum units addressed a wide range of mathematical applications suitable for the kindergartner as well as for the advanced twelfth-grade level.*

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This seminar's resulting curriculum units addressed such topics as Roman aqueducts, bridges, cultures, music, geometric forms, and housing, each with a wide range of mathematical applications suitable for the kindergartner as well as for the advanced twelfth-grade level. Jennifer Esty, who teaches science in a transitional program to prevent young pregnant women from dropping out, will have students combine math, technology and art in the creation of gingerbread houses. Sunny Jonas aims to teach her kindergarten students to engage their senses to promote writing, reading, mathematics, composition, and conversation. An instructional coach who has taught in the elementary grades in a bilingual setting, Pedro Mendia-Landa seeks to integrate architectural mathematical concepts into daily life by helping students observe the environment around them by paying attention to details that can then be quantified, tabulated, measured, graphed, and analyzed, and by allowing students to see the relationships between design and application of measurement, arithmetic, and geometry in the completion of a structure. Ralph Russo, teaching world history at the high-school level, seeks to raise awareness of basic, yet historic, principles of architecture as they apply to the provision of water to an urban center; the architecture of a Roman aqueduct is the focus of his study, which encourages proficiency in quantitative skills, language arts, and organizational skills. Kenneth Spinka connects math to geodesic domes; he and his high school students will design and construct a dome. Donna Wade employs bridges as a vehicle for math instruction in her high-school classroom.

According to the seminar leader,

With opportunities for students to observe, analyze, design and construct projects the inclusive activities for these units offer learning opportunities beyond the classroom. The curriculum units created for this seminar recognize the importance of the talents and interests of individual students as they learn about principles of life through the focus on applied mathematics in architecture.

## Engineering in Modern Medicine

This seminar emphasized how dramatically the practice of medicine has changed in recent decades. For example, couples can test for pregnancy in their homes, a new vaccine is available for chicken pox, ultrasound imaging is available to follow the progress of pregnancy, and small reliable pumps can administer insulin continuously for diabetics. Over a century, the progress has been profound. Life expectancy increased from 50 in 1900 to almost 80 by 2000. People are living longer because they are not dying in situations that were previously fatal, such as childbirth and bacterial infections. The growth of biomedical engineering is a major factor in this extension of life and improvement of health. Biomedical engineers have contributed to every field of medicine — from radiology to obstetrics to cancer treatment to emergency medicine.

The seminar investigated some of the biomedical engineering innovations that have improved patient care. Participants looked at the science underlying these innovations, the design of medical devices, and (in some cases) the mathematics that governs the principles of their operations. The first part of the seminar focused on technologies that have enabled biomedical engineering to enter the modern era: recombinant DNA technology, cell culture technology, and antibody technology. These topics led to a discussion on vaccine development. The group devoted two weeks to drug delivery systems, starting with the conventional forms of drug delivery, such as injections and pills, before expanding to consider new systems, such as stents and transdermal patches. With this information on drug delivery as background, participants discussed the role of engineering in cancer treatment including imaging, radiation therapy, and



Michael Marsland

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*The seminar investigated the biomedical engineering innovations that have improved patient care, the science underlying these innovations, and the mathematics that governs their operations.*

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*The seminar on “Engineering in Modern Medicine.” (Clockwise from left: Fellows Matthew D. Cacopardo and Raymond W. Brooks; seminar leader W. Mark Saltzman; and Fellows Chrissy A. Bieler, Karen A. Beitler, Judith D. Dixon, Carolyn N. Kinder, Chris J. Willems, and Hermine E. Smikle.)*

chemotherapy. The final weeks of the seminar covered dialysis and other blood treatments, artificial organs, and biomedical imaging. The discussions were supplemented with drafts of chapters from a book in progress, *Biomedical Engineering: Bridging Medicine and Technology*, by the seminar leader and Veronique Tran. (The textbook is scheduled for publication in 2007.)

Fellows prepared curriculum units that covered the breadth of biomedical engineering, although the collection focused primarily on the chemical and medicinal aspects of biomedical engineering. Karen Beitler prepared a unit on "Launch Biotechnology in Your Classroom" for high-school science students, focusing primarily on diffusion and its consequences in drug delivery. Chrissy Bieler's unit is on "Dietary Supplements and the Chemistry of Life" for high-school chemistry students; she provides background information on the major components of the human diet and an introduction to metabolism. Targeting students in grades six through eight interested in science-fair projects, Raymond Brooks addresses quality-of-life improvements and offers ways for students to test their own hypotheses about the role of technology on disease progression. Matthew Cacopardo uses the auditory system to blend material from the physical and biological sciences, including hands-on activities to provide tangible experience upon which to build a conceptual understanding of far-reaching concepts in physics. Judith Dixon's unit is for fifth-grade students on human physiology, highlighting the respiratory and cardiovascular systems and the problems that occur in children with asthma.

For fifth-to-eighth-grade science students, Carolyn Kinder offers background on diabetes, focusing on the physiology of the disease, its effect on people who suffer from diabetes, and treatment tools. Marcela Oliveira-Antunovich explores "Interdisciplinary Applications of Chemistry through Engineering: CSI New Haven" for high-school chemistry students, a unit that builds upon the interest of students in forensic science to introduce chemical and engineering techniques important in that area. A high-school teacher of mathematics, Hermine Smikle recognizes math's central role in engineering and introduces techniques to understand biomedical engineering, with examples drawn from diverse areas including cancer cell growth and drug delivery. "The Challenge to Deliver Insulin" is Chris Willems' unit for high-school biology and chemistry students; he concentrates on the chemistry of insulin, the methods of its production by the body, and the techniques that have been used to produce it for use as a drug.

## Anatomy and Art: How We See and Understand

This seminar was based on the assumption that the student's creation of art enriches his or her learning in the sciences. Much of the history of art is dominated by depictions of the human body. From the earliest caveman drawings to Da Vinci to the contemporary digital images of the Visible Human, there is a rich history of efforts to understand our own bodies through art. The use of art encourages tactile and visual learners to express themselves as well as

develops spatial and artistic skills in students with other learning styles. The seminar was designed to appeal to teachers at all levels in subjects ranging from the health sciences, biology and psychology to art. Topics included:

- How depiction of the human body has evolved through the ages and how the social, cultural and scientific environment has affected that depiction.
- How schematic diagrams of the body may be used to clarify complexity.
- How cross-sectional representations of the body are understood and how they can enhance our ability to see three-dimensionally.
- How X-ray, CAT scans and MRIs are obtained and what they reveal about the structure and function of the body.

The variety of curriculum units developed in this seminar reflects the broad range of interests of the Fellows as well as the wide range of target populations. Wendy Decter, a high-school teacher of science, uses the compelling image of the *Vitruvian Man* by Da Vinci to engage her students in a multidisciplinary study of the proportions of the body. Alison Kennedy's unit uses art exercises to teach elementary-grades students about their bodies and how health can be enhanced by making good decisions. Barbara Natale focuses on art projects that teach the skeletal system to fourth- and fifth-grade students. Marisa Ferrarese's unit is the first of three that concentrate on the brain and the senses. Her unit, targeted to fifth-grade students, uses examination of art and medical



Michael Marsland

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*This seminar was based on the assumption that the student's creation of art enriches learning in the sciences.*

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*The seminar on "Anatomy and Art: How We See and Understand." (Clockwise from left: Fellows Wendy Decter, Justin M. Boucher, Sara E. Thomas, Marisa A. Ferrarese, Heidi A. Everett, and Barbara C. Natale; and seminar leader William B. Stewart.)*

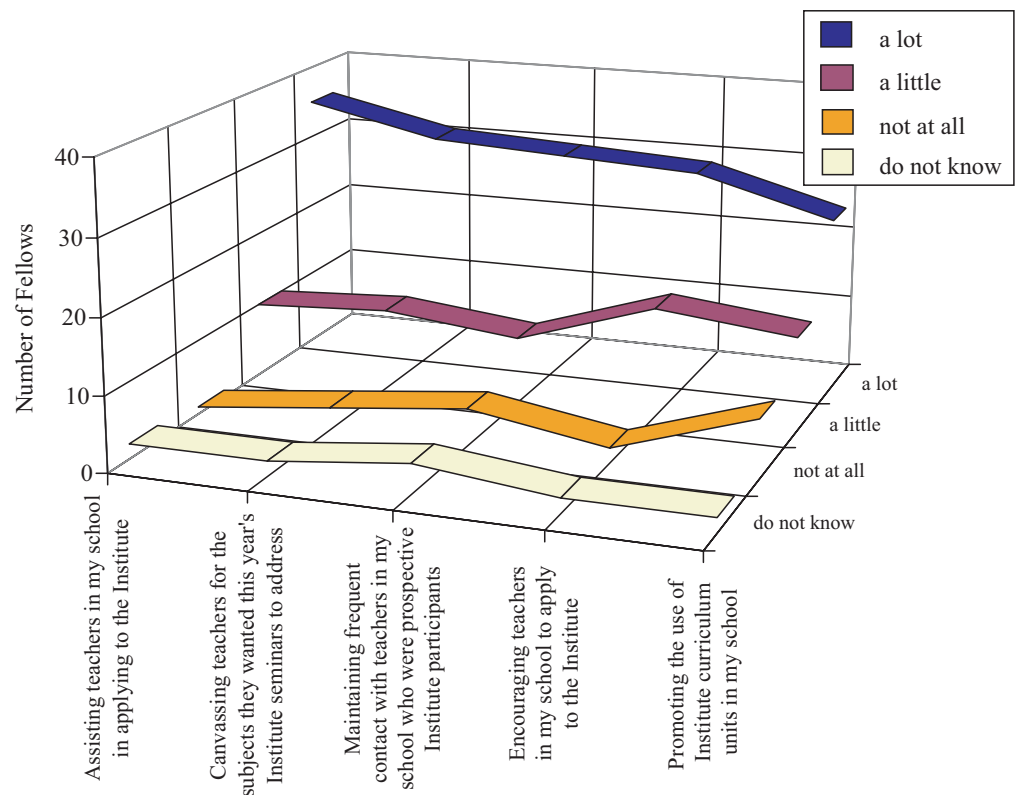
imaging to stimulate inquiry about the five senses. Heidi Everett examines the brain and senses at a level appropriate for high-school students; her lessons aim to incorporate Howard Gardner's multiple intelligences. Justin Boucher's unit is designed to introduce through schematic diagrams the connections of the brain in an AP psychology course. Finally Sara Thomas, an art teacher, developed a unit for high-school students that examines the musculoskeletal basis of movement while furthering their knowledge of the structure of joints.

### The Process of Determining the Seminar Topics

Between October and December 2005, the teachers who served as Institute Representatives and Contacts for their colleagues had canvassed other teachers throughout New Haven elementary, middle, and high schools to determine the topics they wanted Institute seminars to address in 2006. (Please see Appendix for lists of teacher leaders.) The Representatives met together twice monthly and communicated individually with the school Contacts with whom they were responsible for staying in close touch. The Director and Associate Director of the Institute then approached Yale faculty members who were qualified and willing to lead seminars that engaged the desired topics. The Representatives then considered and selected from among their seminar proposals.

In their evaluations, the 2006 Fellows indicated that the Institute Representative for their school had been helpful in many ways: by encourag-

*Chart 1*  
Institute Representatives' Helpfulness to the 2006 Fellows



*The Representatives and Contacts canvassed other teachers throughout New Haven elementary, middle, and high schools to determine the topics they wanted Institute seminars to address and selected from among Yale faculty members' seminar proposals.*

ing and assisting them to apply to the Institute, maintaining frequent contact with them, asking for their views on seminar subjects for the following year, and promoting the use of Institute-developed curriculum units. (Chart 1, reading from left to right, moves from the more helpful to the less helpful activities of the Representatives.) As a result, 44 (85 percent) of all Fellows said in the end that they had, while the program was being planned, sufficient opportunity to suggest possible topics for seminars. This is comparable to the rate of satisfaction indicated by the Fellows in 2003, 2004, and 2005 (80, 76, and 71 percent, respectively).

### The Fellows' Application and Admissions Process

Having worked with teachers in their respective schools during the preceding months, the Institute Representatives met on January 3 to receive for distribution in all schools copies of the Institute application form, brochure, and descriptions of the seminars to be offered. At this meeting a general presentation of the subjects of the seminars ensured that all Representatives could explain to their colleagues the purpose of each seminar. On January 10 the Institute held an open house for prospective applicants where any teacher might learn more about the planned seminars from the Representatives and from the seminar leaders, who made brief presentations about the seminars they would lead and conducted discussions in small groups with teachers who might apply. One typical Fellow found the event "helpful in giving people an idea of what to expect" and how to "find a unit topic to write for their grade level." On January 17 and 24 the Representatives met to discuss their progress in working with prospective applicants and to hand in their own completed applications. The final deadline for teachers applying to the Institute was January 31. This date was selected so that teachers would apply in advance of the February school vacation. The office would then have the vacation period to process application materials, and the review of applications could be completed during February to provide the earliest possible notification to teachers who were accepted.

There are four principal criteria for teachers to be eligible for consideration as Fellows:

- The applicant must be a current New Haven school teacher who will be teaching in New Haven also during the school year following Institute participation.
- The applicant must agree to participate fully in the program by attending and coming prepared to all scheduled meetings and by completing research and meeting due dates in the preparation of a curriculum unit.
- The teacher must demonstrate in the application that his or her specific interests are directly related to the seminar as it has been described by the seminar leader.

- The applicant must also show that the seminar and the curriculum unit that he or she proposes to write are directly related to school courses that he or she will teach in the coming school year.

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*The small size of the seminars is necessary both for collegiality and for the individual attention that each teacher's work in progress receives.*

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For many years it has been the policy of the Institute to allow no more than twelve teachers to enroll in any seminar. The small size of the seminars is necessary both for the collegiality of the Institute experience and for the individual attention that each teacher's work in progress receives from the seminar leader and from other teachers in the seminar. The Institute has aimed each year to gauge the amount of teacher interest in order to offer enough seminars to accommodate almost all teachers who wish to participate. During the planning process 114 teachers expressed definite interest in participating in one of the seminars to be offered. Of those teachers, 54 were from high schools, 18 from middle schools, 17 from elementary schools, and 25 from K-8 schools. By the application deadline, the Institute Representatives, assisted by the school Contacts, had obtained applications from 77 of these elementary, middle, K-8, and high school teachers in the humanities, social sciences, and sciences.

The Fellows application form calls for the interested teachers to specify the subjects and grade levels they teach, the course or courses in which they plan to introduce the material they study in the Institute, and their willingness to meet each of the Institute's requirements for full participation. The applicants also write a brief essay describing why they wish to participate in the seminar to which they are applying, and how the curriculum unit they plan to write will assist them in their own teaching. Writing this essay is, in effect, their first step in formulating a curriculum unit through which they will bring the material they study from the seminar into their own teaching.

A team application form requires interested teachers to demonstrate how the team envisions working together in inter-grade and/or interdisciplinary ways and to outline plans for a culminating activity in the school. Teams may receive preference during the admissions process, and are required to submit a final report on their work together during the following school year. If a team is not admitted as such, however, the members of the team may be admitted to the program as individual Fellows. Also, the Institute encourages all Fellows to work as informal teams in their schools.

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*The Institute supports the school district's efforts to attract and retain qualified teachers.*

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To continue to support the school district's efforts to attract and retain qualified teachers, the Institute placed considerable emphasis again in 2006 on identifying appropriate ways to assist individuals in their first or second year of teaching in New Haven. Connecticut's Beginning Educator Support and Training (BEST) program requires that new teachers prepare a portfolio — including lesson plans, student work, videotaped class sessions, and reflection — in their second year in order to be fully certified. The Institute's work with beginning teachers in 2006 followed a successful three-year pilot (from 2002 through 2004) which showed that the collegial support of the Institute and the development of a curriculum unit could assist new teachers

in entering the New Haven Public Schools and, in certain cases, in completing the required portfolio.

All applications were reviewed by three groups: seminar leaders, school principals, and seminar Coordinators. The seminar leaders examined the applications for their relationship to the seminar subject. This afforded each seminar leader the opportunity, as well, to tailor or enlarge the bibliography for the seminar so that it would address the specific interests of the teachers who would be accepted. At the same time, the applications were reviewed in the applicant's own school; the Institute's Representative for each school provided the school principal a copy of each teacher's application to examine. The intention is to increase awareness within each school of the projects that teachers wish to pursue in Institute seminars, to afford an opportunity for the principal and other educational leaders to examine the relationship between teachers' applications and school plans, and to increase the likelihood that the teachers will have a course assignment in which they can use their curriculum unit. In this review, principals answered the following questions:

- Is the applicant's proposal consistent with, and significant for, the curricula and academic plans for your school?
- List the courses and/or the grade levels where the proposed unit will be used; if there are none, state "none."
- Will the applicant be assigned next year one or more of these courses in which to teach the unit?
- Please indicate any special merits or problems you find with the applications.

When this procedure was introduced in 1998, Reginald Mayo, Superintendent of the New Haven Public Schools, had written to all principals: "We believe this is a highly promising way for ensuring that the assistance that the Institute provides to individual teachers and to teams of teachers has the best prospect for advancing each school's academic plans." This process informs the consideration of each application, provides each applicant pertinent guidance, and provides an opportunity for Institute Representatives to talk with their principals about the Institute.

The following examples of principals' comments on the Fellows' applications illustrate how they appreciate the significance and usefulness of the curriculum units that teachers in their school will be designing.

[This applicant] will work with the entire science department to continue to develop a range of upper-level science courses.

This appears to be a creative unit that will engage students in learning about concepts in the environmental sciences. Highly recommended.

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*All applications were reviewed by three groups: seminar leaders, school principals, and seminar Coordinators.*

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*Principals appreciate the significance and usefulness of the curriculum units that teachers in their school will be designing.*

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[This applicant] will continue to teach eleventh-grade humanities and Advanced Placement U.S. history, and will develop senior history electives. [He] is an outstanding teacher whose participation will benefit the seminar.

Her proposed curriculum unit relates very well to the fourth-grade curriculum. Her unit sounds very interesting and will serve to motivate students to read about this important era in America's history.

The proposed unit is both timely and meaningful for the students. It is directly connected to the curriculum.

The planned unit of study . . . improves achievement in reading, is aligned with New Haven Public Schools social studies standards and incorporates components of the NHPS social development curriculum.

The unit deals with narrative writing, which is covered in the third-grade curriculum and on the Connecticut Mastery Test.

The proposal is . . . appropriate to the curriculum for our seventh- and eighth-grade social studies classes. I am positive she will also utilize her lesson in her language arts classes . . . It is wonderful that she truly understands the importance of planning for good instruction. Her ideas are realistic and "fun" for students.

This proposal is directly linked to the curriculum she teaches. With our increasing Hispanic population, the background she will obtain through her involvement with the Teachers Institute will prove valuable to both her students and the school community.

The application fulfills the Connecticut science standards for chemistry.

The proposal directly connects multiple topics in geometry and offers real-world applications of math.

Students will be able to learn how to do research in a specific area of study, biology.

As in the past, the Institute formed a group of teachers who served as Coordinators to assist with the organization and smooth operation of the seminars. The Director, with the advice of teacher leaders, selects these Coordinators from the group of Representatives who become Fellows and who had earlier helped to select seminar subjects and identify interested teachers.

There is one Coordinator in each seminar. They act as liaisons between the seminars and a Coordinators committee to facilitate the exchange of information and to provide teacher leadership without diminishing the collegial rap-

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*Coordinators provide teacher leadership without diminishing the collegial rapport within each seminar.*

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port within each seminar. A seminar Coordinator must be, and must intend to continue as, a full-time teacher in one of New Haven's public schools. A Coordinator accepts the following responsibilities:

- To work with school Representatives at the conclusion of the application process, to serve on an admissions committee to consider proposals for curriculum development submitted by teachers applying to become Fellows, and to make recommendations to the Director about whom to accept as Fellows.
- To monitor the progress of a seminar through observation and conversation with participants, and to give progress reports at weekly seminar Coordinators committee meetings.
- To report to the seminar members any organizational information which should be circulated, such as the schedule of any visitors and notice of Institute-wide activities.
- To act as a resource for members of the seminar, providing information about unit-writing deadlines, guidelines for writing curriculum units, computer assistance available to Fellows, copyright procedures, and University facilities Fellows may use.
- To be available to the seminar leader to provide information on Fellows' perceptions of the seminar and on Institute policies generally, and to offer assistance as may be needed.
- To assist with the smooth operation of the seminar by keeping track of Fellows' promptness and attendance and the timeliness of their written submissions, and by encouraging Fellows to make and keep appointments for individual meetings with the seminar leader.
- To attend and come prepared to weekly committee meetings with the Director or Associate Director and to take professional days as needed for the above purposes.

The Coordinators work together as an admissions committee for the Institute. They met after school on February 1 to conduct a first reading and discussion of the applications to their respective seminars. They then contacted all teachers whose applications needed to be clarified or amplified. On February 8 the Coordinators met for a full day, by taking professional leave, for their final consideration of most applications. They met again on February 14 to resolve issues remaining in a few applications.

During their review, the Coordinators considered the findings of the school administrators and seminar leaders and made recommendations to the Director about which teachers the Institute should accept. By these means, the Institute seeks to ensure that all Fellows participate in seminars that are consistent with their teaching assignments and applicable in the courses they teach.

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*The Institute seeks to ensure that all Fellows participate in seminars that are consistent with their teaching assignments and applicable in the courses they teach.*

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The Institute accepted as Fellows 65 New Haven teachers, 36 in the humanities and 29 in the sciences and mathematics. A joint meeting of seminar leaders and Coordinators was held February 28 to discuss the admissions process just completed, and to review the seminar and unit writing process and the policies and procedures of the Institute. In this way, the Coordinators began to provide the seminar leaders with information about the teachers who had been accepted and to discuss their role in assisting with the conduct of the seminars.

### The Fellows Who Were Accepted

Fellows came from 23 of the district's 45 schools, including eight of the twelve New Haven high schools, all three of the middle schools, seven of the fourteen K-8 schools, one of the three transitional schools, and four of the 13 elementary schools. The Institute first admitted elementary school teachers in 1990; this year nine (14 percent) of all Fellows were elementary school teachers — a lower percentage than in recent years because of the trend in the district toward establishing more K-8 schools. Twenty four (37 percent) were middle or K-8 school teachers (including several in the elementary grades), and 32 (49 percent) were high school teachers. Overall, 15 Fellows taught grades kindergarten to five, 18 taught grades six to eight, and 32 taught grades 9 to 12. Seven schools had four or more Fellows, and eleven schools had three or more.

Consistent with the Institute's aim to serve the largest possible proportion of all New Haven teachers, 23 (or 35 percent) of the teachers accepted in 2006 were participating in the Institute for the first time. Of these first-time Fellows, 10 were in the humanities and 13 were in the sciences. Seventeen percent of all the Fellows accepted (eleven of 65) were Black, three quarters (48 of 65, or 74 percent) were non-Hispanic White, six percent were Hispanic, and three percent were of Asian descent.

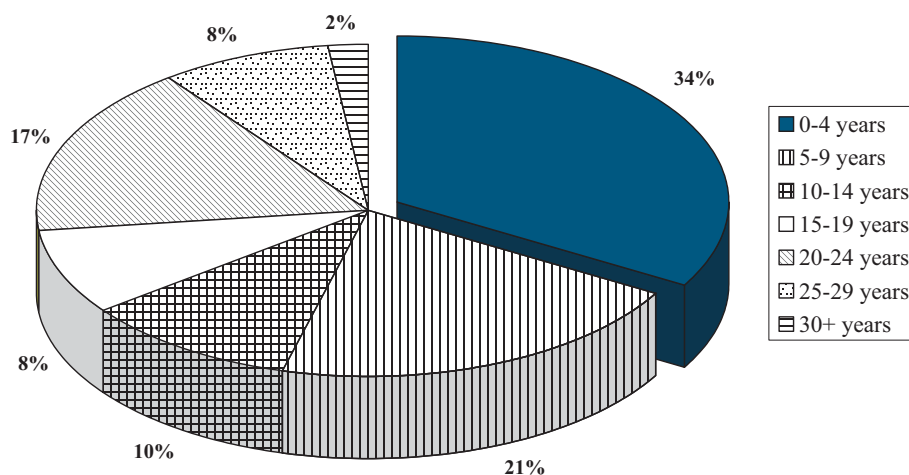
The participants included teachers from all stages of their careers. Seven first-year and two second-year teachers applied and were accepted to participate. Overall, one third of Fellows were age 30 or younger and almost half (47 percent) were 40 or younger (compared with 30 percent as recently as 2001). Twenty percent of Fellows were 41-50 years old; and 33 percent were older than 50.

As Chart 2 shows, one third of the Fellows (34 percent), had four or fewer years of experience in teaching. More than half (54 percent) had four or fewer years of experience teaching in New Haven. This is greater than the proportion of Fellows with so little experience during 1998 through 2001, when the average was 20 percent. In 2006 one quarter (27 percent) of the Fellows had twenty or more years of total experience in teaching; one fifth (20 percent) had twenty or more years teaching experience in New Haven.

Indicative of the need for the professional development that the Institute provides, nearly seven in ten Fellows (69 percent) had been in their present teaching position four or fewer years. This helps to explain why many teachers

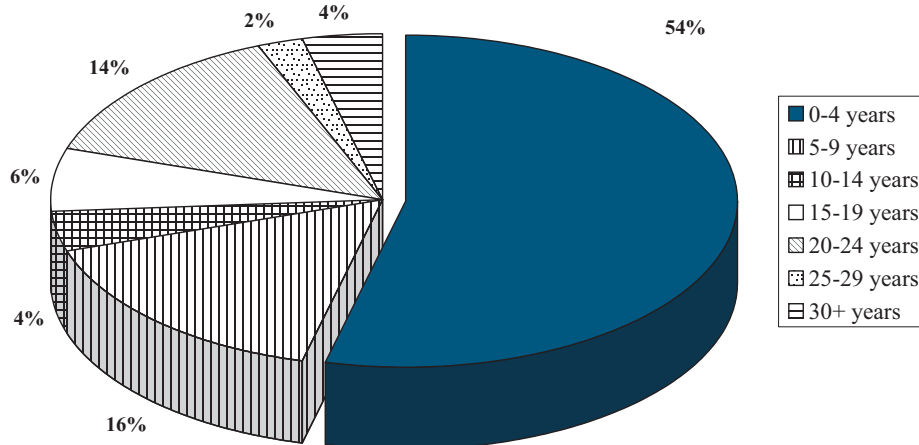
Chart 2

Total Years Teaching Experience for 2006 Fellows



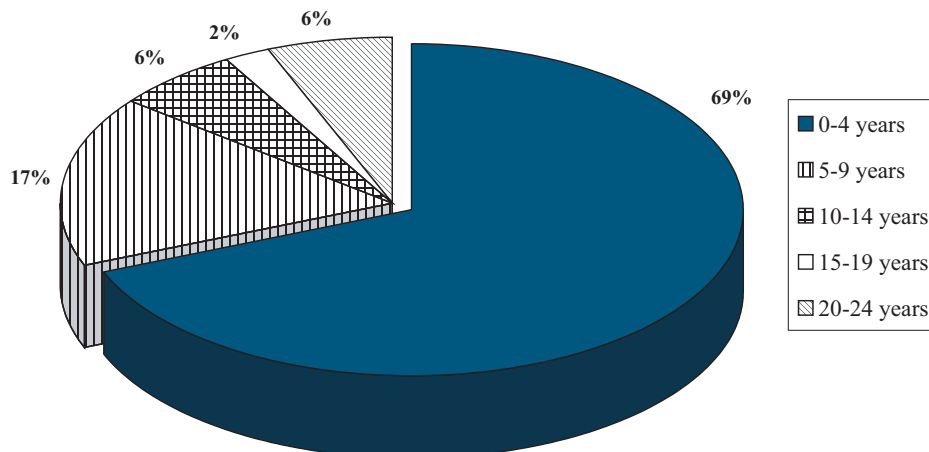
Total Number of Respondents = 48

Total Years Teaching Experience *in New Haven* for 2006 Fellows



Total Number of Respondents = 50

Total Years Teaching Experience *in Present Position* for 2006 Fellows



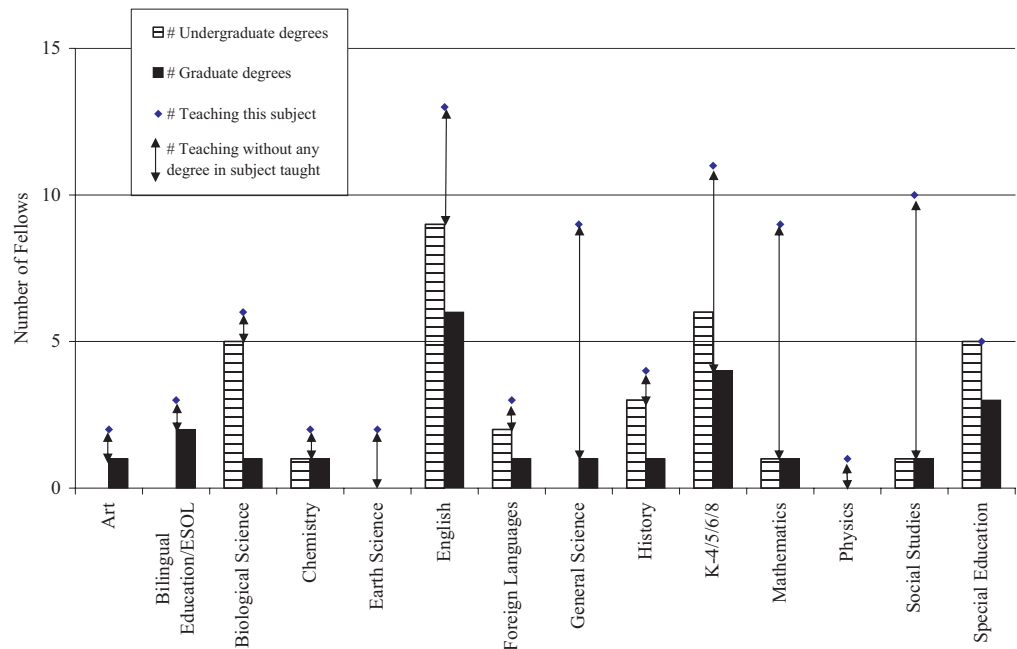
Total Number of Respondents = 48

*Indicative of the need for the professional development that the Institute provides, nearly seven in ten Fellows had been in their present teaching position four or fewer years.*

say they need to deepen their knowledge in subjects they have been recently reassigned to teach, or curricular materials for students of a different age or background from those they have taught before.

As in past years, many of the 2006 Fellows did not major in college or graduate school in the subjects they currently teach. As Chart 3 shows, in no field other than special education did all Fellows teaching a subject have a graduate or undergraduate degree in that subject. In two fields — earth science and physics — no Fellows had a graduate or undergraduate degree. Only one of nine teachers of general science had a graduate or undergraduate degree in that area; the same was true in mathematics. Only two in ten teachers of social studies had a degree in that field. Four of thirteen teachers of English lacked a degree in the subject.

*Chart 3*  
Number of Fellows with Degree in a Subject They Taught  
in 2005-2006

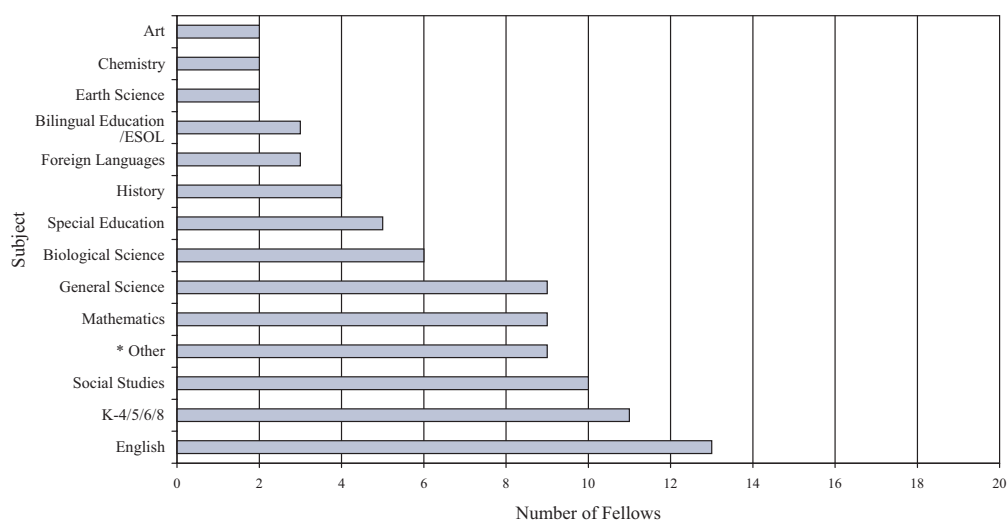


*Many of the Fellows did not major in college or graduate school in the subjects they currently teach.*

Chart 4 shows the subjects Fellows taught in the 2005-2006 year of their Institute participation. Overall, almost half (46 percent) of Fellows in the humanities and three quarters (72 percent) of Fellows in the sciences had not majored either in college or in graduate school in one or more of the subjects they taught in that year.

Understandably, then, when the 2006 Fellows were asked about the incentives that attracted them to participate in the Institute, they responded (as Chart 5 shows, reading left to right from the most to the least important) that the most important incentives were the opportunities to develop materials to motivate their students (96 percent), to increase their mastery of the subjects they teach (92 percent), to exercise intellectual independence (92 percent), to work with

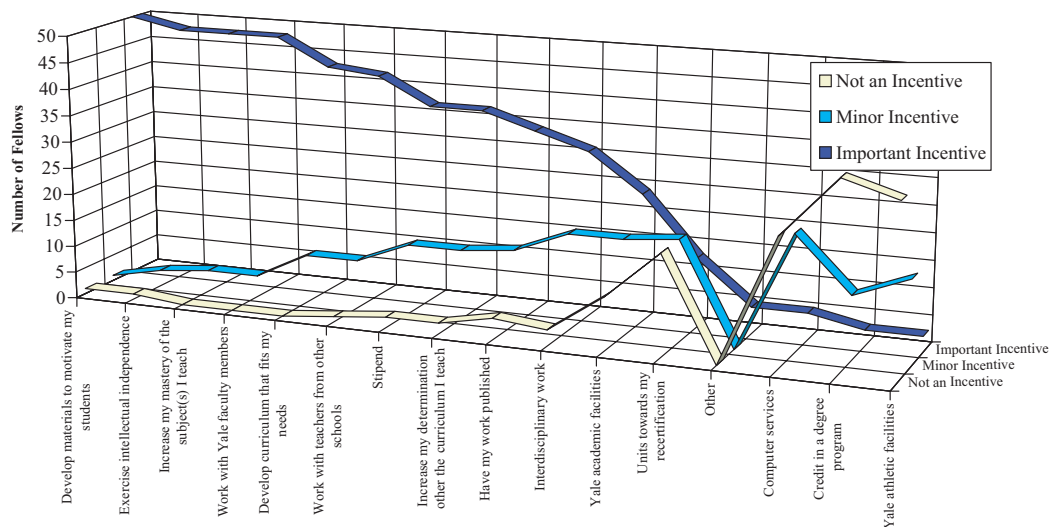
Chart 4  
Subject Taught by 2006 Fellows



\*Includes an instructional coach and teachers of music, journalism, environmental science, forensic science, computer science, reading, and African American heritage.

university faculty members (92 percent), to develop curricula to fit their needs (83 percent), and to work with teachers from other schools (81 percent). Incentives one might imagine to be important for teachers with access to Yale University — opportunity for credit in a degree program and access to Yale athletic facilities — were much less important for Fellows in the Teachers Institute.

Chart 5  
Incentives for 2006 Fellows to Participate



*The most important incentives were the opportunities to develop materials to motivate their students and to increase their mastery of the subjects they teach.*

As past Institute studies have shown, Fellows are in most respects highly representative of all New Haven teachers. So, for example, this year's Fellows continue to reflect the gender and ethnicity of all New Haven teachers, though as in other cities there are great disparities overall between the ethnicity of New Haven teachers and of their students. (See Table 1.) Similarly, the Yale faculty members who have led Institute seminars generally reflect the wider faculty at Yale.

Table 1

## Ethnicity and Gender of Participants

	White non-Hispanic			Black non-Hispanic			Hispanic			Other		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
Institute Fellows, 2006	75%	21%	54%	13%	4%	9%	8%	2%	6%	4%	0%	4%
Institute Fellows, 1978-2006	70%	21%	50%	24%	5%	19%	5%	1%	4%	1%	0%	1%
New Haven Public School Teachers, 2006	74%	20%	54%	17%	4%	13%	7%	2%	6%	2%	0%	2%
New Haven Public School Students, 2006	11%	6%	6%	52%	27%	25%	35%	17%	18%	2%	1%	1%
Institute Coordinators, 2006	67%	50%	17%	17%	0%	17%	17%	0%	17%	0%	0%	0%
Representatives and Contacts, 2006	63%	20%	43%	24%	4%	20%	11%	5%	6%	2%	0%	2%
Institute Seminar Leaders, 2006	83%	67%	17%	0%	0%	0%	17%	17%	0%	0%	0%	0%
Institute Seminar Leaders, 1978-2006	86%	72%	14%	8%	5%	2%	5%	3%	2%	1%	0%	1%
Yale Faculty, 2006 (includes tenured and term ladder faculty)	82%	69%	31%	3%	1%	2%	2%	2%	0%	13%	8%	5%

Totals may not add to 100% due to rounding.

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*Fellows are in most respects highly representative of all New Haven teachers.*

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## Activities for Fellows

At the first organizational meeting of each seminar, held on March 7, the seminar leader distributed an annotated bibliography on the seminar subject and presented the syllabus of readings that he or she proposed the seminar would consider. The Fellows described the individual curriculum units that they planned to develop. This afforded the members of each seminar an overview of the work they were undertaking together and the projects they would pursue individually. The bibliographies both introduced the seminar subject and guided Fellows as they began research on their curriculum units. Several Fellows remarked on the value of their seminars' reading lists. One said, "Readings were appropriate, and adjusted as needed." Another remarked that the seminar leader "offered many supplemental materials in addition to the reading list." Another Fellow said readings "will help in the classroom by helping show students the critical details of history rather than the obvious trite ones." One seminar leader said that despite the varied topics of Fellows' own curriculum units, the seminar "itself, with the syllabus readings," did lay "a groundwork" for those units. According to another,

The seminar was more interactive than a typical class of mine at Yale. Because our syllabus and mission was broad, I allowed the Fellows to shape the direction that each meeting took.

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*Annotated bibliographies both introduced the seminar subject and guided Fellows as they began research.*

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Before the second seminar meeting all Fellows met individually with their seminar leader to discuss their projects. The Institute requires that Fellows schedule at least two such conferences as part of the unit writing process; many Fellows, however, meet more frequently with their seminar leader. At the end of the program, almost all Fellows (92 percent) said they had ample opportunity to discuss their choice of readings with the seminar leader. According to one Fellow, "the times I met individually with my seminar leader were helpful with writing and ideas." Another said a different leader "was helpful in all stages," providing "suggestions about improvement of the unit writing and content."

One seminar leader "organized the first individual meetings, specifying that they come to my office for the appointments." That way, "I could easily access my own shelf of books and make recommendations. This proved very useful." Another seminar leader suggested Fellows meet with him at a bookstore "because I thought it might set a more relaxed tone for our discussions. That seemed to work. . . . All of them seemed quite respectful, eager, and open." A third leader mentioned providing Fellows in these meetings with "reading resource lists tailored to their projects." Another said,

My meetings with individual Fellows were direct and to the point. I tried to steer them as quickly as possible toward topics I thought would work, and away from topics that seemed unwieldy or infeasible.

During the period that preceded the regular weekly meetings, Fellows continued their reading, both preparing for the upcoming seminar discussions and working toward a brief prospectus of what their final units would contain. At the second seminar meeting, on April 11, Fellows submitted the prospectus, presented their revised unit topics, and began to discuss common readings. The regular weekly seminar meetings began on May 9; thereafter Fellows continued to develop their units in stages, with a first draft submitted May 30. The weekly meetings of the seminars continued through July 18, with Fellows submitting the second draft of their units July 5 and completed units by July 31.

Fellows submit the prospectus, together with a revised unit topic and a list of appropriate readings, at the time of the second seminar meeting. This allows them six weeks to write a first draft. The due date for the second draft is late enough to allow Fellows ample time to address the comments they received on the first draft from other Fellows and from the seminar leader. Most Fellows have been satisfied with this schedule and its well-worked-out series of deadlines during the spring and into the summer. Overall, 79 percent of the Fellows (compared with 75 percent in 2005 and 78 percent in 2004) thought the unit writing deadlines occurred at the right time in relation to the school calendar. In contrast to a few who thought the program should conclude either earlier in the spring or later in the summer than it does, in a typical remark one Fellow said, "The Institute is very well-organized and I have always appreciated the timeline and deadlines that keep me 'on track' in meet-

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*"My meetings with individual Fellows were direct and to the point. I tried to steer them as quickly as possible toward topics I thought would work."*

—Seminar Leader

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*"The Institute is very well-organized and I have always appreciated the timeline and deadlines that keep me 'on track'."*

—Institute Fellow

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ing obligations." Another "thought the way the due dates worked out was very effective," while another called "careful planning" one of the program's virtues.

Fellows spoke of the benefits of an extended period for research, writing, and reflection. One said, "During the writing process teachers spend time researching a subject area they would never have been challenged to research. . . . This provides a sense of ownership." Another said, "Having the opportunity to plan, review, revise, and amend certainly produces a unit that is exciting for me as well as my students." Another said,

Given the amount of time I spent pondering what activities should be used and when I feel there will be a greater understanding and excitement. . . . My teaching will be much smoother because of how prepared I am for the subject matter.

The Institute attaches great importance to the process through which Fellows develop their curriculum units. Many Fellows commented on the value of following this process — including not only guidance from the seminar leader but also suggestions from other Fellows. One called the seminar leader "very positive and motivating. I'm sure I worked much harder on my unit simply because I felt guided and encouraged." Another Fellow said, "During the writing process, our leader gave feedback and offered advice on how to improve our units. He was always available to meet with us." Another appreciated how her seminar leader "had great suggestions, extreme patience and was not overbearing; this made me quite comfortable. Overall, my knowledge . . . has increased greatly."

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*The Institute attaches great importance to the process through which Fellows develop their curriculum units.*

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Michael Marsland

*The seminar on "Anatomy and Art: How We See and Understand." (Left to right: Fellows Sara E. Thomas, Marisa A. Ferrarese, and Heidi Everett.)*

Discussion in seminar of Fellows' work-in-progress contributes both to unit development and to the seminar experience. One said it was "beneficial having the input and support of other teachers. I really enjoyed hearing how other teachers put their units together." A Fellow in a different seminar said it "contained the perfect balance of sharing lessons plans with providing pertinent information." According to another, "Toward the later seminar meetings we shared and tried out our lesson plans. This was extremely helpful in refining classroom activities for my curriculum." Others said:

Writing my unit, I was initially intimidated and unsure of how to even begin. However, I found more than enough support, especially through my seminar Coordinator and Fellows who had previously written a unit, as the seminar went on.

I enjoyed working with teachers from other schools. We shared our work and discussed common reading. Much of the discussion and reading period helped us to broaden our scope. . . . All contributed greatly in developing my curriculum unit.

The seminar participants were a vital part to the success of this year's experience. Each Fellow had the opportunity to teach a lesson from their unit. . . . This experience provided me with the opportunity to understand more about both the content areas and grade levels that Fellows were teaching, learn the material from a different perspective, and consider additional ways to present the information.

At the conclusion of the seminars, most Fellows indicated that the program schedule (88 percent) and the guidelines for writing a unit (88 percent) had been useful to them to a great or moderate extent. This year half (48 percent) of the Fellows said they tried out the subject matter and three quarters (73 percent) said they tried out the strategies of their units in their classroom. Of those who did, almost all Fellows (85 percent) said the students' reactions influenced what they included in the final units. For example, one middle school teacher of history wrote,

My seminar did a great deal to address [a] gap in my education. Almost immediately, I had new information to share with my students. . . . When I was able to incorporate this information into my teaching, I saw how excited my students became. . . . One of the topics was the Spanish-American War. . . . Because I knew more about the long-term implications of the war for Puerto Rico, my students were much more enthusiastic about learning about it.

During the first two months of the program, which serve as a reading period, all Fellows also met together on Tuesday afternoons for a series of talks by current or prospective seminar leaders. These talks are designed either to

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*"I found more than  
enough support,  
especially through  
my seminar  
Coordinator and  
Fellows who had  
previously written a  
unit."*

*—Institute Fellow*

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acquaint Fellows with the work of seminars other than their own, or with subjects of possible future seminars.

Current seminar leaders gave three of the talks: Alexander Nemerov on "Reading and the Imagination: N.C. Wyeth and Robert Louis Stevenson," Mark Saltzman on "Engineering in Modern Medicine," and Stephen Pitti spoke on "Latino Cultures and Communities." Two prospective seminar leaders also gave talks: David Bercovici on climate change, earthquakes, hurricanes, volcanoes and the geophysics of "Natural Hazards," and David Katz on "The Care and Feeding of *Homo sapiens*: Are We Truly Clueless?"

The talks were popular. One Fellow said the talks were "excellent and well received." According to another, they "were always interesting and full of information I was eager to share with my students and other teachers." Another called the talks "a great way of learning about the other seminars and topics in the forefront of research and education." Another characterized the "diversity and quality of the lectures" as "exceptional." Scattered criticisms concerned whether precious time might be used differently. More typical was this comment:

The talks were a great strength in the program. Through these talks, I became very interested in some of the topics that the other seminars were discussing, and because of this will be sure to look into the units from those Fellows.

Most Fellows saw in the talks the purposes for which they were organized. Virtually all (98 percent) Fellows said that to a great or moderate extent the talks provided intellectual stimulation, while most (92 percent) said they

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*"The talks were always interesting and full of information I was eager to share with my students and other teachers."*

*—Institute Fellow*

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*David Bercovici speaking on "Natural Hazards."*

provided a sense of collegiality and common purpose among Fellows. More than three quarters (83 percent) said the talks were successful to a great or moderate extent in providing an overview of Fellows' work in the seminars. A similarly high proportion (86 percent) said the Institute scheduled the right number of talks. Many Fellows reported that the talks prompted them, to a great or moderate extent, to read about the talk topics (57 percent), discuss the topics with their students (63 percent), and discuss the talks with other teachers (83 percent). These figures were comparable to, or even slightly higher than, those of prior years.

As in other recent years, the Institute scheduled an early workshop on curriculum unit writing. As part of their admissions folder, all Fellows had received Institute guidelines and mechanical specifications for preparing curriculum units, which outline the Institute writing process and the steps for Fellows' formulating, reformulating, and expanding their individual units. On March 21, the teachers serving as seminar Coordinators comprised a panel in leading the discussion on curriculum unit development.

The Coordinators spoke from their own experiences as Institute Fellows in researching and writing curriculum units. They selected for emphasis the topics they thought it was especially important for all Fellows to understand: "Narrowing Your Topic and Considering Your Audience"; "Following the Institute Process for Unit Development"; "Aligning Your Unit with School Plans and District Goals"; "Using Technologies for Research and Writing"; "Using the Institute's Reference Tools"; and "Collegiality and Professional Development: The BEST Portfolio and Beyond." After questions, the Fellows went into seminar groups, where each Coordinator led a discussion of purpos-



Michael Marsland

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*Coordinators spoke from their own experiences as Institute Fellows in researching and writing curriculum units.*

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*Session on Curriculum Unit Development. (Left to right: Seminar Coordinators Justin M. Boucher, Maria Cardalliguet Gómez-Málaga, Jacqueline E. Porter-Clinton, Chris J. Willems, and Crecia C. Swaim.)*

es and practices in writing Institute curriculum units. This offered an opportunity for the first-time Fellows to learn about the guidelines and other aspects of curriculum unit writing from experienced Fellows. It encouraged veteran Fellows to share their experience and allowed all to discuss how the completed volume of units might display a range of teaching strategies and contain a standard form of annotation. By leading these discussions, the Coordinators also identified themselves as being knowledgeable about the process of writing curriculum units, so that other Fellows might seek their advice.

On May 31 the seminar Coordinators organized a discussion to recognize and encourage the beginning teachers who were participating as Fellows. This was an opportunity for the experienced Fellows to congratulate their new colleagues for participating in the Institute during their first or second year of teaching, to invite them to seek support from Fellows who had faced similar challenges, and to reflect with them on teaching in New Haven.

At weekly meetings with the Director and Associate Director, held the day after seminar meetings, Coordinators discussed the progress of each seminar and gained an overview of the program. Both seminar leaders and Fellows acknowledged in their evaluations the essential role of the Coordinators. All Fellows agreed (70 percent "strongly") that the Coordinators provided teacher leadership without diminishing the collegial relationship within the seminar. Fellows found the Coordinators to be helpful either a lot (90 percent) or a little (8 percent) in providing information about unit writing deadlines; helpful either a lot (77 percent) or a little (21 percent) in providing information about guidelines for unit writing; helpful either a lot (75 percent) or a little (23 percent) in monitoring the process of the seminar through observation and conversations with seminar members; helpful either a lot (73 percent) or a little

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*Both seminar leaders and Fellows acknowledged the essential role of the Coordinators.*

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Michael Marsland

*Seminar Coordinators Chris J. Willems and María Cardalliaguet Gómez-Málaga.*

(25 percent) in providing information about the use of University facilities; and helpful either a lot (73 percent) or a little (23 percent) in facilitating discussion of Fellows' work in progress. Few Fellows found the Coordinators unhelpful in any respect. Overall they received considerable praise not only from Fellows, but also from seminar leaders. According to one Fellow, "The Coordinator did an excellent job of reminding people of their obligations without being rude" and "offered help to other Fellows." A Fellow in a different seminar said: "Our Coordinator was always actively involved in class discussions and was very helpful." A participant in a third seminar wrote that the Coordinator was "always available, enthusiastic, and helpful." Another called that Coordinator "extremely effective." From another seminar:

My Coordinator . . . was of great assistance to me throughout the seminar. He kept a strong line of communication between the leader, himself, and all of the Fellows. This allowed for us to operate as a team . . . comfortably.

To maintain current information on the program and to address any problems that arose, the Institute Director and Associate Director met monthly with the seminar leaders as a group. This also gave the seminar leaders, four of whom were conducting an Institute seminar for the first time, an opportunity to talk with one another about their approaches and experiences.

### Rewards for Fellows

The seminars are the core collaborative experience of the Institute. In 2006, as in past years, most Fellows' responses to the seminar experience have been strongly positive, at times enthusiastic. One Fellow had "nothing but positive things to say about my seminar leader, colleagues, and the rich conversations we had"; the seminar leader's "style of teaching is exceptional. He helped me see things . . . I would have dismissed prior to participating." Another said, "Interesting content, a small collegial group of Fellows, and a dedicated, conscientious seminar leader made this year's Institute a rewarding experience." Another described it as "challenging, yet rewarding. We covered a lot of materials/topics for the time allotted. The professor . . . was willing to help in any way she could." Another said simply, "It was one of the best learning experiences I have ever had." Others wrote:

The seminar experience was very rewarding. The seminar leader provided excellent leadership and readily encouraged Fellows to participate in discussions. . . . he succeeded in facilitating follow-up comments, clarifications, and amplifications of ideas from each of us.

It proved to be a very interesting and enjoyable experience. The group of teachers represented all levels of teaching from elementary through middle and high school. We got along very well and were able to discuss the [material] in a meaningful and uninhibited manner. This was due greatly to the leadership. . . . The atmosphere was

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*The seminars are the core collaborative experience of the Institute.*

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very congenial throughout and I for one was sorry to see the end of the seminar. Everyone. . . was very helpful and a joy to be with.

My seminar experience was wonderful. . . . My seminar leader was excellent and I enjoyed the time spent with my colleagues. My seminar leader was not only very knowledgeable about the field but he was also very helpful.

My experience this year has been extremely positive. . . . The readings and the seminars were carefully planned. . . . Everyone in the seminar had a positive attitude, and the seminar leader always facilitated discussion and participation. Presenting the units to other Fellows helped everyone to understand what others were doing. I had very high expectations for the seminar that I have fulfilled.

The professor was knowledgeable, personable, and easily adapted the [seminar] to the Fellows as it progressed. We saw a wide range of sources and points of view and lots of good primary sources.

My seminar leader was always well prepared and provided the seminar with interesting readings on engaging subjects. The members of the seminar were always professional during seminar discussions. I feel that I learned a great deal about my seminar topic, which will be very helpful to me as a teacher.

This year's seminar offered a variety of opportunities to read materials I had never read before. . . . As an English teacher I had never. . .



Michael Marsland

*The seminar on "Anatomy and Art: How We See and Understand." (Left to right: Fellow Barbara C. Natale; seminar leader William B. Stewart; and Fellows Wendy Decter, Justin M. Boucher, Sara E. Thomas, Marisa A. Ferrarese, and Heidi A. Everett.)*

learn[ed] about the civil rights movement. This . . . is something I will definitely use in my classroom.

I don't believe anyone would have felt uncomfortable and inadequate in this dialectical setting. . . . [The seminar leader] was fantastic, thought-provoking, and understanding. . . . She was interested in our units and . . . [kept] us moving.

My experience . . . was excellent. . . . [The seminar leader] . . . showed us how medicine, medical devices and techniques have changed and the possibilities that exist for the future. He also shared his colleagues, his students and his laboratory with us. The seminar group was also very knowledgeable.

My seminar leader engaged us weekly with Internet sites, presentations on relevant topics and open discussion. . . . We were able to perform hands-on activities. . . . This seminar was so incredible and awesome, one that I will never forget and will incorporate in my teaching for many years.

I had a wonderful experience. The first three or four meetings were comprised of [the seminar leader's] disseminating important information for our units. . . . After these initial meetings we briefly discussed our units. Our professor then tailored the remaining sessions to our needs. As we continued these meetings. . . we brainstormed ideas about how to adapt the lessons. . . . He did a fantastic job. . . [and] allowed ample time for us to present questions.

Illustrating the Institute's demanding process of unit development and the interchange among seminar leaders and Fellows in this process, one Fellow wrote:

The seminar gave me the opportunity to work with a great collaborator, content specialist, and humanist seminar leader. . . . [He] shared his knowledge and research with us and we shared our teaching experiences, research and best practices. . . . In addition, each of us met with him at least two times in person. We also communicated with him by way of telephone and e-mail. On all of these occasions, he made himself available to us and was flexible in allocation of his time. He helped us to stay focused on our work, which made the process easy. During the seminar, Fellows presented their units in progress several times . . . . It was so exciting and motivating. What a job well done!

The Yale faculty members who led seminars commented on the benefits they derived. Two examples follow:

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*"I don't believe anyone would have felt uncomfortable and inadequate in this dialectical setting. . . . [The seminar leader] was fantastic, thought-provoking, and understanding."*

*—Institute Fellow*

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*"I profited from thinking through some of my seminar topics, and pushing myself to make the topics more engaging and accessible, without losing rigor. I am sure that this will benefit my Yale students."*

—Seminar Leader

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I benefited tremendously from my participation in the Institute. It was refreshing to see the enthusiasm of teachers who are helping students prior to their entry to college, and I am sure that this will help me in my teaching of freshmen, in particular. I profited from thinking through some of my seminar topics, and pushing myself to make the topics more engaging and accessible, without losing rigor. I am sure that this will benefit my Yale students, as well.

Each time I lead one of these seminars I find my own background expanding. . . . This year I designed my seminar on a new topic for me, although I am generally familiar with [it], and I designed it specifically to "test drive" the course so that I could teach it in one of the new Yale freshman seminars this fall. So for me the seminar was particularly useful.

Fellows cherished the opportunity to cross the artificial boundaries that often separate schools, disciplines, and grade levels. One Fellow said, "We had a good group of Fellows, representing different grade levels taught, years of experience in teaching, and topics. . . . Fellows were respectful and supportive." Another said, "It is the only opportunity that I know where I can get input from teachers all over the district." A high school teacher who appreciated "the opportunity to work and share teaching experiences with a wide cross-section of teachers" found it "encouraging to hear the elementary and middle school teachers." This Fellow continued,

It was also rewarding to share my experiences with other high school teachers of different subject areas. This provided me with



Michael Marsland

*The seminar on "Photographing America: A Cultural History, 1840-1970." (Seminar leader Alexander Nemerov.)*

information that was valuable to my approach to developing the unit and my approach to teaching in general. [This] also ignited a valuable exchange from the other teachers. They could see the connections that needed to be made between subject areas.

Other Fellows wrote:

If I knew a lot about the subject I wouldn't have taken the seminar; the collegial atmosphere was open-minded and welcoming. It was easy to ask questions and think out loud. I really benefited a great deal.

The other Fellows in my seminar also helped to make this experience enjoyable. They offered lesson plan ideas, Web sites they knew on the topics, books and journals that might be helpful, etc. We had established a strong bond throughout the seminar and it made the experience less stressful and much more exciting!

Several teachers spoke of the inspiration they discovered working together — and of their belief that their camaraderie contributes to retaining teachers in New Haven. One said, "YNHTI was one of the best things about teaching in the New Haven Public School district this year." Another, "very pleased" with the Institute, thought it "was great to be able to connect with other teachers in New Haven." Another Fellow said,

I met a lot of great New Haven teachers, and got to see different points of view through their eyes. Anytime teachers from different schools are put into the same room, it is beneficial for all. We were able to share ideas and learn from not only individuals, but also their school communities.

The Institute's participants and staff have been asked over the years whether the co-professionalism among Yale faculty members and New Haven school teachers, for which the program is widely known, is authentic. The mutual respect between Fellows and seminar leaders characteristic of the seminars attests to the collegiality on which the Institute is founded. One seminar leader mentioned "the high level of ambition of most of the Fellows and their eagerness to complete their units." Another leader believed the units the Fellows produced "were uniformly competent, and quite a few were excellent. I was truly impressed with the creativity." Another leader commented,

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*The mutual respect between Fellows and seminar leaders attests to the collegiality on which the Institute is founded.*

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The . . . Fellows were dedicated, very interested and active participants in the seminar. The group developed an esprit de corps which created a great bond between very different personalities. Everyone, including myself, seemed to enjoy a strong sense of learning and sharing.

Fellows, too, expressed admiration for their Yale colleagues and for this joint enterprise of teaching and learning. In typical comments Fellows said that their seminar leaders were "extremely knowledgeable, supportive, and inspiring"; "very knowledgeable and congenial"; and "fantastic, thought-provoking and understanding." Another "would definitely take" a future seminar with the leader. A different leader "was particularly helpful in the writing of my curriculum unit." Another "was supportive and made the seminar very interactive." Other Fellows said:

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*"His style of teaching encourages participation. He never forgets that we are teachers who will go into our classrooms with the skills and strategies we have learned from him and from each other."*

—Institute Fellow

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[The seminar leader] is an excellent teacher. . . . He took his time and let ideas develop and let people take their time and think. I want to incorporate this into my own teaching style. The other thing that made the [seminar] outstanding was his knowledge. . . . He led interesting discussions, and helped create a feeling of camaraderie among us all. I enjoyed every week.

[My seminar leader] was available for consultation even when we were not meeting specifically to discuss my unit or my topic. He is a very skillful teacher and modeled several questioning techniques to elicit conversation. These techniques I included in my unit and used in my classroom as well as my summer teaching program.

[The seminar leader] both puts his Fellows at ease and challenges us so that our discussions are lively and there are many moments of revelations. . . . Everyone participated in our discussions very regularly and we developed camaraderie. His style of teaching encourages participation. He never forgets that we are teachers who will



Michael Marsland

*The seminar on "Engineering in Modern Medicine." (Left to right: Fellows Judith D. Dixon and Karen Beitler; seminar leader W. Mark Saltzman; and Fellow Chris J. Willems.)*

go into our classrooms with the skills and strategies we have learned from him and from each other.

[The seminar leader] was passionate and knowledgeable about the content. . . . He used our units to guide his instruction and presented complex information thoroughly and understandably. He compiled activities, presentations, and readings to help us understand. . . . [His] regard for our units, interests, and well being was impressive. He was sincerely interested in our group as a whole and was willing to make himself continually available for our needs.

[The seminar leader] conducted the seminar with a high degree of professionalism. He was a good listener, accommodative to our ideas and concerns. He was willing to learn from us as we were willing to learn from him. He cultivated an atmosphere of collegiality, where one could experience reciprocity and respect. He acknowledged that each member of the seminar brought their strength and weakness and he was able to meet each one at his/her own level. He not only provided timely feedback during the writing process, but took a keen interest in the individual units.

My seminar leader was a pleasure to work with. He was very knowledgeable on the content area and he presented it with enthusiasm. He was open to altering his planned discussions to allow for any other topics the Fellows would like the opportunity to learn about. He was critical in assisting me to write my unit, not only with his expertise on the subject but with advice on my focus and how I wanted the unit to unfold. He was always available, easy to talk to, and very encouraging.

### Relating Seminar Topics to Curriculum Units

Each Institute seminar must balance the complementary and inseparable but sometimes competing demands for studying the seminar topic and developing applications of that knowledge for school classrooms. The Fellows, from elementary, middle, and high schools, are obligated to develop curriculum units that have some demonstrable relation to the seminar topic. Yet they are free to devise curricula that enter territory not covered in detail by the seminar. The curriculum units, therefore, have a diversity of subject and method that one would not expect in a regular university course. As a result, discussions in the seminar, while doing justice to the common reading, can also range widely over substantive and pedagogical issues relating to the curriculum units. Some comments by seminar leaders and Fellows quoted earlier have indicated that each seminar approaches these demands differently as seminar leaders strive for an appropriate balance.

The Institute encourages Fellows to incorporate in their curriculum units both subject matter and skills that are called for by the local curriculum frame-

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*Fellows commented on the ways Institute-developed curriculum units help implement aspects of the district curriculum framework and create engaging material for students.*

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work — including a strong emphasis upon literacy — and assessed by the statewide Connecticut Mastery (CMT) and Academic Performance (CAPT) Tests, administered during 2006 in grades three through eight, and ten, respectively. Some Fellows commented on the ways Institute-developed curriculum units help implement aspects of the district curriculum framework and create engaging material for students. One Fellow said of a unit whose "emphasis is on writing" that, "since the unit covers many of the standards and expectations, it will enrich the teaching of writing and social studies." Another's unit provides "a practical way to integrate . . . architecture into math strands/standards." A teacher of science wrote,

My teaching will be enhanced, more up-to-date and more detailed after this seminar. My students will benefit in the exposure to new and current medical techniques and . . . new career choices. Overall the units produced in this seminar are all relevant and within standards adopted by the city and state . . . We will all benefit from this seminar as we update our curriculum and introduce our students to the new standards in education.

Other Fellows said:

This unit delivers a variety of standards neatly packaged in a well thought-out unit. I am excited to have so many topics in one unit which directly relate to the students. I use the Institute to generate unique and exciting curricula for my students . . . stylizing lessons that interconnect standards rather than teaching them separately.

As far as the school curriculum goes, I hope this unit will help to get students more interested and excited. It is another way of helping students to increase the amount and quality of their writing.

While I was a participant in the seminar, I also had the privilege of working to rewrite the district's social studies curriculum. . . . I made sure that the experiences and history of Latinos was included in a much more significant way.

My unit will add excitement to my teaching the classical civilizations component of the world history curriculum. It will also add a "hands on" research project . . . [giving] students a meaningful task that reinforces curriculum standards.

The unit I wrote was written with two of the National Council of Teachers of Mathematics standards. . . . Students should be presented with real-world problem-solving. . . [and] see the relationship between mathematics and other subject areas.

I was able to develop a comprehensive plan that aligns with both my school's mission and Connecticut state standards. I was also

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*"I was able to develop a comprehensive plan that aligns with both my school's mission and Connecticut state standards."*

*—Institute Fellow*

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able to use the knowledge of a Yale professor to ensure the accuracy of the information, determine most relevant content, and that it is all current. My students will reap the benefits of the curriculum by using less of their assigned student textbook and more discussion, inquiry-based learning, active participation, creative interpretation, and discovery.

The content of my seminar directly correlates with district standards . . . I am now more knowledgeable concerning the advances the have been made in medical imaging and this will assist me in teaching my students concerning advances in sciences and technology. The students will also benefit from my increased knowledge of the software and programs available that aid in teaching anatomy.

The effect . . . my curriculum unit and Institute participation will have on my teaching, students and school curricula is profound. . . District standards in science state that we need to use the inquiry approach. . . Biomedical engineering is a good way to help students think about their lives and the effect of diseases.

In the end, most Fellows (90 percent) said there had been a successful balance between general study of the seminar subject and Fellows' units in progress. As one said, "there was a good balance between talk about our units and . . . the readings." According to another,

Collaboration . . . provided refreshing interaction with colleagues with similar interests and goals. The seminar was directed with astute care by our seminar leader . . . working to meet each individual's needs.

After the units were completed in July, they were compiled in a volume for each seminar. In October the volumes were deposited in the libraries of all elementary, middle, K-8 and high schools, so that all New Haven teachers might use them in their teaching. As in the past, the Institute prepared a *Guide* to the new units, based on authors' synopses and recommendations of the grade levels and school courses to which their units apply.

The Institute updated the Index of all 1588 units contained in the 176 volumes published since the program's inception in 1978. The *Index* and *Guide* were deposited in school libraries and distributed to the teachers serving as Institute Representatives for the schools. The new curricular resources were provided to district administrators responsible for curricula system-wide. And the Institute continued to replace volumes missing from school library sets, based on its annual survey of Institute resources located in all schools. As described below, the Institute has also published electronic versions of the units, *Guide*, and *Index* to make its curricular resources even more widely available.

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*"The content of my seminar directly correlates with district standards. . . This will assist me in teaching my students concerning advances in sciences and technology."*

*—Institute Fellow*

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## Results for the Participants

Fellows in 2006, as in past years, spoke of the results of their Institute participation especially in terms of intellectual growth and renewal. Just as the opportunity to increase mastery of the subject one teaches was an important incentive for most Fellows (92 percent) at the outset, everyone said they had gained knowledge of their subject and confidence to teach it by participating in their seminar. All Fellows agreed with the statement that the seminar helped with intellectual and professional growth; three quarters (83 percent) strongly agreed. As one put it, "The seminar provided rigorous professional development that kept me cognitively engaged."

Many Fellows described the Institute experience — including the research for and writing of curriculum units — as having increased their professional confidence, subject mastery and morale, while nourishing their own as well as their students' curiosity. One who "wanted to expand my knowledge in an area of literature that I found myself having to teach often" left the seminar "much more confident in my own understanding." Another said, "My hope was to challenge myself intellectually which I certainly did"; the seminar leader "was an excellent teacher from whom I learned so much." Another expects her unit to have "a wonderful effect," having "learned a lot about how our body . . . functions." Moreover, she learned "ways to explain these functions. . . on a level that students easily understand." Another said the Institute "keeps my teaching . . . fresh." Others said:

The seminar has broadened my understanding of architecture and structural engineering. The experience has left me with far more

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*Fellows described the Institute experience as having increased their professional confidence, subject mastery and morale.*

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Michael Marsland

Fellow Ekaterina Barkhatova teaching her Institute unit to students at Dwight Elementary School.

confidence in those areas than I had previously. I expect that my teaching of these topics will improve with this increased knowledge and confidence.

I feel confident in teaching my unit because of the time and support that was put into it. My unit may be taught in the language arts, social studies or social development classroom. I'm excited about teaching my unit!

My experience in the Institute this year was very positive. . . . My initial feelings were overwhelming. . . because of my lack of knowledge on the subject. In this seminar not only did I learn a great deal . . . but also it allowed me to build confidence in my ability to adapt what I learned to teach my students.

Preparation of a unit of this kind with the intensive background information covered certainly is the way in which to properly design and instruct in the classroom. This unit was specifically designed with my students in mind. It is like having a tailor-made suit designed specifically for you. It fits to a tee. The middle school language arts curriculum in New Haven is integrated with social studies curriculum so my unit will definitely be used.

Institute participation always makes me a better teacher, by increasing the depth and breadth of my knowledge and by providing me with more contacts within the New Haven school district. The sense of community developed through participation in the Institute is valuable to me.

I am broadening my knowledge base and certainly making myself a better teacher, better equipped to help my students. My curriculum will also be enhanced . . . because I have discovered new ways to teach poetry and engage students.

Aside from the benefits the students will get from the actual unit, I believe that I am now better prepared to handle some of the questions and confusion that my students may have about their heritage and background.

The Institute validated my love of teaching, the excitement of research and writing curriculum. I learned so much and cannot wait to share it with others. My passion will motivate the students.

I believe my teaching will benefit from witnessing [the seminar leader's] style. . . . I also learned numerous tricks and workable lesson ideas from the other teachers in the Institute. My curriculum will directly affect my classroom.

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*"The Institute validated my love of teaching, the excitement of research and writing curriculum. My passion will motivate the students."  
—Institute Fellow*

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My unit will infuse my teaching with a greater depth of scientific content than I have had in the past. I will be much better prepared this year to approach this content. My students will benefit. . . . I have made connections and done interdisciplinary work that will make this material more accessible and interesting.

Fellows spoke, too, of their access to Yale facilities. From the Institute's inception, all Fellows have been full members of the University community, listed in the directory of faculty and staff, and granted use of facilities and services similar to that of their Yale faculty colleagues. They receive a University identification card, computer account, and borrowing privileges at University libraries. For most Fellows (81 percent) access to Yale's academic facilities such as the library was an incentive to participate; 84 percent reported that membership in the Yale community had been greatly or moderately useful to them.

To acquaint Fellows with the facilities available to them the Institute offered special tours and orientations to the Cross Campus Library, Sterling Memorial Library, Beinecke Rare Book and Manuscript Library, and Center for British Art, Yale Art Gallery. These were in addition to the program talks and seminars themselves and were conducted by professional staff of each facility.

One Fellow wrote, "The Yale atmosphere and benefits added to this teacher's morale." Other Fellows "liked having access to Yale facilities" and "value using the Yale libraries . . . throughout the year." Another said a "highlight of the seminar was the laboratory tour." A participant in a different seminar said, "We took a trip to the anatomy lab — what an amazing resource!" Another Fellow in that seminar elaborated,

We visited the Yale medical laboratory where we observed cadavers, explored the many wonderful systems of the human body and had a hands-on demonstration of how to perform a medical autopsy. We were also able to have a hands-on experience dissecting the human brain. We also attended the Yale Art Gallery to observe the human body depicted in art over the ages and in various genres. We attended the Yale medical library to examine ancient medical books and pictures.

Fellows see the results of the Institute as extending beyond their own classrooms, and beyond the teachers who have themselves personally participated in the seminars. Almost all Fellows said that they plan to encourage or assist other teachers in using the unit they prepared. More than half planned to do so with three or more other teachers. In all, Fellows planned to encourage or assist a total of 243 other teachers. One plans "to share my unit with the teachers in my grade level, as we are all required to teach some aspects of the topics." This, the Fellow said, "will be a good way to expand upon what we are mandated to teach and make the learning more in tune with students." Another said,

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*Almost all Fellows said that they plan to encourage or assist other teachers in using the unit they prepared.*

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I am better prepared to assist and guide my fellow teachers in creating units for their classrooms. Because of the many resources that my professor has given me, and that I have discovered, I can not only help these teachers informally, but I can guide them to resources that will help them to better understand their students.

Fellows discussed the more extended influence the Institute has had, and will have, for them and their schools. One said, "I plan to share not only the unit with fellow teachers, but also strategies I have learned." Another "look[s] forward to a better working relationship with my Latino students and their families due to the knowledge I gained." A Spanish teacher intends "to do a unit along with our history teacher this year since we both participated in the seminar. This should give my subject area a whole new burst in [the] school system." A science teacher's unit treats "such environmental topics as land preservation, species endangerment, energy use, resource use, air and water pollution, and solid waste disposal." He continued,

My students will benefit from the lesson plans that I have developed, and I anticipate that they will develop a greater enthusiasm for course materials that I use. In addition, the curriculum units that I have written for use in AP environmental science continue to enrich the district curriculum. . . . A primary goal that I have set for the course is to raise student achievement in the national AP examination. The 2006 curriculum unit I have written is another step forward.

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*"The curriculum units that I have written continue to enrich the district curriculum. A primary goal is to raise student achievement."*

*—Institute Fellow*

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Others wrote:

I will make a significant change in my curricula this year when I integrate some of the material from the seminar into the course. I will be able to integrate some of the material into the district curricula as well. . . in history and language arts. The seminar was "eye-opening" and hopefully will have the same effect on our students.

I believe the current curriculum will strongly benefit from my unit. It can be used in any high school chemistry, biology, health, or nutrition class. . . . I expect that other teachers will realize the positive impact this unit can have.

My school's curriculum will benefit greatly. We are a multimedia technology, art, and multicultural inter-district magnet school. This unit incorporates all avenues of our school mission statement.

Every year we review separately the responses of first-time and of veteran participants because we want a high proportion of New Haven teachers to become Fellows and for the Institute to become a regular part of Fellows' professional lives. Both groups cite their own rewards. One first-time participant

would "certainly participate in the Institute again" and "encourage other teachers . . . to do so." Another, who described "exuberance in learning," called the program "a great opportunity to share in the Yale experience, to learn about an interesting subject and write usable curriculum." Others said:

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*"The Institute made me excited to be a student again [and provided] insight into the teaching of my students in ways that . . . professional development workshops rarely do."*  
—Institute Fellow

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I really enjoyed and learned a lot in my seminar. . . [which] increased my content knowledge about the topic but was also a springboard for personal learning and professional growth. . . . Having a concrete program through which I can practice being a lifelong learner with other teachers, and being able to apply it to my teaching in a very practical way, was wonderful.

I found everyone . . . friendly and accommodating. My seminar leader, in particular, treated all of us with respect and was very helpful in the completion of my curriculum unit. While teachers are regularly trained in how to teach, we rarely get to discuss what we teach. The Institute clearly addresses that need. It made me excited to be a student again [and provided] insight into the teaching of my students in ways that . . . professional development workshops rarely do.

### Experiences of First- and Second-Year Teachers

We also continue to pay particular attention to the results of the Institute for beginning teachers. Several of the 2006 Fellows who were first- or second-year teachers were among the most enthusiastic participants in the Institute. One "benefited from carefully planning my unit . . . . Clearly justifying all of my curriculum choices helped me plan better." A number of these new teachers spoke of what they gained from seminar colleagues, including informal mentoring. A first-year chemistry teacher called her seminar "very intellectually stimulating" and said,

Since I do not have much background in biology, I was very nervous about participating in this seminar. However, the material was very interesting and was presented in a way that I could easily grasp. I was very fortunate to work with such a great team this year in the Institute.

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*"As a first-year teacher I needed all the support possible and all the interactions with veteran teachers as possible. I found that here in the Institute."*  
—Institute Fellow

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Another science teacher said,

As a first-year teacher, some said I was crazy to do the Institute with everything else that I had on my plate. . . . My thought was that I needed all the support possible and all the interactions with veteran teachers as possible. I feel I found that here in the Institute. The Institute provided an atmosphere for intellectual growth as well as interactions with colleagues of other disciplines, which I feel I may not have gotten elsewhere. . . . This experience has provided insight

to what I wish to do in the classroom as well as a way to utilize my curriculum unit for the BEST portfolio. As I head into a time in my career that I have to focus on the BEST portfolio, the resources provided from the Institute will assist me.

Following are characteristic comments from other Fellows in their first year of teaching:

I believe that the success of my Institute seminar is largely due to our seminar leader, whose knowledge and resources appeared limitless. . . . My fellow Fellows also contributed to the quality of the experience. . . . All were as focused on my success as they were on their own. These are very compelling characteristics; true teamwork in a scholarly setting. Finally, I attribute the quality of this experience to the resources of Yale University. . . . The seminars encouraged original thinking and reflecting on significant, contemporary subjects. I am proud to be part of this process.

My participation in the Institute provided many opportunities to strengthen my teaching. My experience with the seminar has increased my awareness of how I can integrate more hands-on activities for the science classroom and how to design the activities so they are more inquiry-based. The seminar also provided me key networking opportunities throughout the district and with Yale. I am more aware of and comfortable with using Yale's facilities to enhance my teaching and the experiences of my students.

The Institute's teacher leaders — both school Representatives and seminar Coordinators — have been attentive to, and have begun to include, beginning teachers. In fall 2006 more than one third of the Representatives (seven of 19) were individuals who initially had participated in the Institute during their first or second year of teaching in New Haven. Five of the Representatives volunteered to mentor new teachers in the New Haven Public Schools. In this role, they support other teachers both in the classroom and in the creation of their portfolios. In these ways the Institute has assisted with the induction and retention of new teachers and, in doing so, has strengthened and renewed its own leadership.

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*The Institute has assisted with the induction and retention of new teachers and, in doing so, has strengthened and renewed its own leadership.*

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For returning Fellows, the rewards of participation do not diminish over time. The experience becomes cumulative, rather than repetitive or redundant. Many teachers report that the benefits increase as one gains experience as a Fellow. One returning participant who thought this "the best Institute in which I have ever participated" cited "many things that made it good." Another spoke of "quality seminar leadership." Others said:

This year's seminar experience was most rewarding. [We had a ] knowledgeable seminar leader, bringing in resources that proved

useful across grade levels. . . . Non-fictional and fictional selections, audio materials, and engaging discussion helped us to better understand the diversity, complexity, and challenges past and present. . . . Each engaging seminar session helped participants.

My seminar . . . was a wonderful experience. Every time I drove home from a seminar meeting, I felt as though my eyes had suddenly been opened to new observations. . . . [The seminar leader] is an amazing teacher.

I have used every curriculum unit that I wrote for the Institute. There is no doubt that they enhanced my knowledge and gave me the confidence to try new things in the classroom. . . . One unit I use every year is a curriculum designed to get students who are not college bound interested in going to college. It is also designed for students who think they might want to go to college but have no idea what college is like. . . . Because of the Institute I have a curriculum ready. . . as well as writing assignments. It has even made some kids want to go to college. . . . Another unit I continue to use every year is [on poetry]. Once again, it built my confidence in my ability to teach poetry. Because of this I include some form of poetry in all my English classes. . . . I can't say enough how valuable these seminars are to teachers and therefore to New Haven students.

I have been able to enhance the reading/writing curriculum by teaching my units to students. Quite a few of my units have centered around biographies and because I have become familiar with each

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*"I have used every curriculum unit that I wrote for the Institute. They enhanced my knowledge and gave me the confidence to try new things in the classroom."*

*—Institute Fellow*

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Michael Marsland

Fellow Mary Lou L. Narowski teaching her Institute curriculum unit to her students at John Martinez School.

figure . . . I am better able to guide my students as they explore the lives of these people in guided reading, shared reading, and independent reading sessions. Because I keep in mind the Connecticut standards as well as my district's initiatives. . . it all fits.

The topics of mathematics and architecture are the perfect match when trying to integrate multiple curricular areas under one theme. Therefore, I was able to explore ways of doing so to enrich the New Haven district's curriculum.

I feel my teaching is improving a great deal since I am part of the Institute. Some of the most creative lesson plans I have developed lately have been under the inspiring influence of the Institute. I think being around other enthusiastic teachers has a lot to do with this.

Every year since 1990, when they became a regular part of the Institute, elementary school teachers have noted the particular advantages of the Institute for them and their curricula. For example, one elementary school teacher among the 2006 Fellows said,

I learned a great deal about the . . . cultures of the many Latino students I teach. I am now better prepared to teach these students. . . . I do not have a strong historical background. . . . this seminar filled in many of the gaps.

As already described, Fellows especially value the Institute's bringing together teachers across grade levels. One elementary school teacher wrote,

My favorite part of the seminar was being able to converse and collaborate with other colleagues. Throughout the school year, there is little time for teachers to meet and socialize with other teachers. By participating in this Institute . . . I enjoyed learning about what other teachers are doing at the middle and high school levels.

Seminar leaders, too, speak of what they gain from participation. They not only recognize their growing involvement in public education and the University's home community; they also perceive benefits to their own scholarship and teaching. One seminar leader this year said, "The Institute experience has influenced my scholarship and involvement with science and engineering programs sponsored by professional groups throughout the state." Another wrote, "Because I am teaching [a related course] in the fall to Yale undergraduates, this seminar I'm sure gave me an excellent head start on what works, and what doesn't." This leader "also learned a great deal from . . . Fellows. . . . [whose] wisdom will find its way into . . . my fall lectures." Others said:

I learned a tremendous amount about New Haven and . . . the ways that my work at Yale does and does not translate into high school

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*"I leave the Institute with a much greater interest in helping teachers who want to introduce related content into their classrooms."*

—Seminar Leader

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and grammar school classrooms. . . . I leave the Institute with a much greater interest in helping teachers who want to introduce related content into their classrooms. I will be eager to talk with my undergraduates and graduate students about these experiences.

I developed material that I will now use in my [university] teaching. I plan to incorporate various . . . exercises into my teaching. Most of these are exercises that I developed as examples for the Fellows. Since I have no formal training in teaching, I learned a considerable amount of pedagogy from my Fellows.

### Benefits for Students

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*The ultimate purpose of the Institute is to strengthen teaching in New Haven's public schools and in this way to improve student learning.*

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The ultimate purpose of the Institute is to strengthen teaching in New Haven's public schools and in this way to improve student learning throughout the schools. Contrary to what some would expect of a partnership involving Yale University, the Teachers Institute intends to serve students at all achievement and performance levels. Fellows usually, in fact, write their units for students at more than one level. While nearly all of the Fellows (94 percent) reported that their new curriculum units were designed for their "average" students, three quarters (75 percent) reported that they were designed for their "advanced" students and almost as many (65 percent) reported that they were designed for their "least advanced" students. Fellows commented on these multiple purposes. One said her seminar leader "presented these fun and engaging activities with suggestions as to how to modify them for different student populations." Another wrote,

My unit will have a direct effect on my teaching because it was a learning process for me as I wrote it. All the research I did had made more informed. . . . It also allowed me to reflect on best teaching practices for the particular group of students for whom the unit was intended. I had to take a good look at their needs as a unique group and design my instruction around that. This was great.

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*"I am excited about using the unit . . . when a teacher is excited about teaching it usually goes better for students."*

—Institute Fellow

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The plans of other Fellows illustrate the wide range of unit use anticipated in the schools. One now has "a much stronger base of knowledge to use in choosing the literature I will be giving to students." Another said, "The unit I constructed will give students an in-depth knowledge of Dr. King. It will also inspire students to develop more character." Another Fellow who expects the curriculum unit "to motivate students greatly" always tries "to innovate in my classes so students participate more actively and work. I believe this unit is going to fulfill these expectations." Another said her unit "should be very practical and useful" in "my teaching of narrative writing" and show students "the importance of detail in their writing." This Fellow observed, "I am excited about using the unit. As with most things, when a teacher is excited about teaching it usually goes better for students." "This," she concluded, "is one of the great positives that comes from participation in the Yale Institute." Another,

who intends to use her unit "in both my journalism and English class," said it "will affect at least 50 students." She continued, "Because of the Institute I now have confidence in my ability to teach photography. And because of the curriculum unit I now have a plan on how to do that."

To attempt to gauge the impact of this year's units in New Haven classrooms, we asked Fellows about the number of students to whom they planned to teach their new unit, and on how many days. Forty nine of the Fellows planned to teach their unit to 20 or more students; 24 said that they would teach their unit to 50 or more students. The total number of students to be taught a unit by this year's Fellows is more than 2500. Chart 6 indicates the lengths of time the Fellows planned to teach their units. For almost all Fellows, the unit is a significant part of their teaching plans.

As in past years Fellows were optimistic about the responses they anticipate receiving from their students to the material they had studied and developed in the Institute. Nearly all (91 percent) of the Fellows agreed that, as a result of Institute participation, they have a higher expectation of their students' ability to learn about the seminar subject. We have already quoted Fellows who spoke about what they gained, how their own enthusiasm for a subject would motivate students, and how they planned to involve students more actively in classroom learning. Others said:

Students are used to opining rather than describing. This seminar taught me how to get a stimulating discussion involving visual

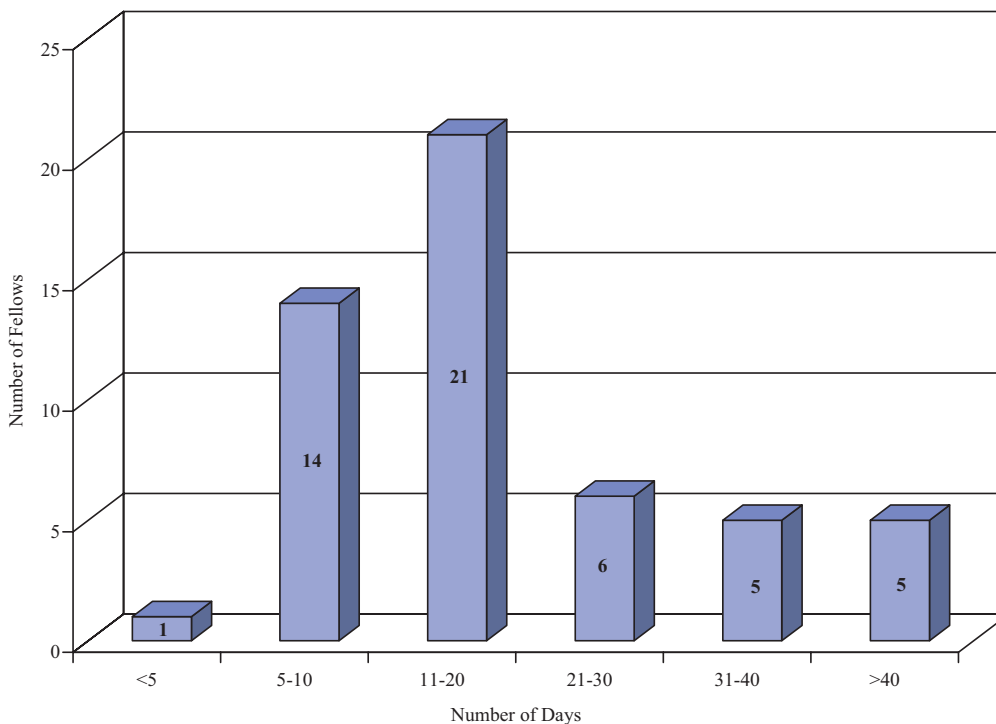
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*Nearly all Fellows agreed that, as a result of Institute participation, they have a higher expectation of their students' ability to learn about the seminar subject.*

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Chart 6

Number of Days 2006 Fellows Plan to Teach Their New Unit



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*For almost all Fellows, the unit is a significant part of their teaching plans.*

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*"My unit will infuse a reasonable element of enthusiasm into the teaching of math."*

—Institute Fellow

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analysis, and our seminar leader also modeled how to get everyone involved. . . . I hope to transform students' approach to visual material from that of mere audience members to that of engaged witnesses. This seminar will be of immense help.

My unit will infuse a reasonable element of enthusiasm into the teaching of math, which is sometimes perceived as overwhelming. Traditional lesson plans may fail to sustain academic enthusiasm, when math becomes too abstract.

I've had a great chance to read materials that will supplement many of the books we read in class. For instance, we read *Native Son* and . . . after being involved with the Institute, I do feel I can give [students] a more extensive and varied background.

My teaching will be improved because I now have so much more knowledge to share with my students. . . [who] will really enjoy the lessons that I have so thoughtfully crafted.

My students will benefit because I have learned new knowledge. . . I have [also] learned a variety of new ways to present the material. . . . By participating in the Institute I have help in writing curriculum I would have to write anyway. This way the curriculum is tested, well thought-out and facilitated by an expert in the field.

Several Fellows commented on ways their Institute experience will help their students learn science:

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*"My teaching will be improved because I now have so much more knowledge to share with my students."*

—Institute Fellow

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Michael Marsland

Fellow Hermine Smikle and her calculus students at Hillhouse High School.

The students will be more engaged with inquiry-based lessons which should instill a sense of curiosity, resulting in a deeper understanding and most importantly appreciation for the subject matter.

My lessons will become more hands-on, creative, and relevant. Students will benefit by becoming more engaged in lessons and being asked to use their critical thinking skills. . . . I plan to make my science curricula more interdisciplinary and include more reading and writing, including original sources and nonfiction.

I have gained new teaching strategies and have established strong lesson plans for my unit that I have already used in the classroom and will continue to use in the future. I have been made aware of other resources that are available to me, such as Web sites and journals, that will be essential to me as a teacher in the many years to come. My students will also benefit . . . . I have created my unit around them.

In participating in the Institute I had made the decision to write a unit that would be interdisciplinary based on the interests of all my students. The unit was able to incorporate chemistry, biology, and physics, which will inevitably prove beneficial to the school environment.

My enhanced understanding of DNA technology will help me with the biology course curriculum I'm teaching. Cell culture technology is a topic I think students will find fascinating. . . . Vaccines and antibodies are also an essential part of the biology curriculum, and having specific examples to use in the classroom is very useful. . . . Drug delivery . . . [will be] captivating for my students. The chemistry and materials science in this topic neatly address several science standards.

We also asked Fellows who had participated in prior years to report on student responses they had actually observed when teaching units developed in the Institute. Their retrospective comments resembled their optimism about new units. Several Fellows' comments follow.

For students of American history, this prior unit offered numerous opportunities to make connections between seemingly widely spaced and varied events. I have taught about these themes in my U.S. II and civics classes and have also included some of the material in my U.S. I class.

Most of my previously written Institute curriculum units have been developed for my teaching of environmental science. My students have benefited from my development of classroom, laboratory, and

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*"The students will be more engaged with inquiry-based lessons which should instill a sense of curiosity, resulting in a deeper understanding."*

*—Institute Fellow*

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*"The units developed through the Institute have improved the course significantly."*

—Institute Fellow

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field activities through my participation in the Institute. The AP environmental science course continues to attract substantial student interest, and I frequently hear that the course is one of the most popular science courses among my school's students. . . . The units developed through the Institute have improved the course significantly.

Students have benefited from the new approaches and ideas I have brought back to my classroom. . . . The seminar helps to keep you aware of the curriculum in other grades . . . . My students have also had the benefit of doing . . . exciting things like constructing bridges, making models of the planets, and writing . . . poems.

My first unit related to mathematics and solving word problems. . . . It is a very useful unit that I continue to use. It made solving word problems more fun for my students. . . . My second unit. . . I was able to integrate science, math, and language. . . . It fits perfectly into the New Haven curriculum.

My participation in past years has increased my motivation to teach subjects with materials and curricula that I created. It also increased my students' motivation. . . this motivation helped create an environment that was conducive to learning with minimal to no behavior problems to impede the learning process.

I use material from all the past seminars in my classes all the time. I select seminars based on what I don't know - which is a lot - and

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*"My students' motivation helped create an environment that was conducive to learning."*

—Institute Fellow

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Michael Marsland

Fellow Waltrina D. Kirkland-Mullins, standing at left, with Sarbani Basu, leader of the seminar on "The Sun and Its Effects on Earth," and students from Davis Street School. The students' project, resulting from the curriculum unit Ms. Kirkland-Mullins wrote in the 2005 seminar, won a prize at the New Haven Public Schools' Science Fair in 2006.

the seminars help me out more than I ever anticipate! I use the new vocabulary and concepts as well as the "facts." . . . Kids ask about things all the time and the Yale seminars help me shape an answer or a new question for my students. I feel more prepared.

I have used my first unit on children's books in a series every year. The third graders I teach are at the "just right" age for these types of books and the unit is very motivating for them to read. My second unit . . . was [also] a great success. The students enjoyed the activities and learned the material.

Curriculum units. . . enhanc[e] required courses of study. Last year, for example, I had the privilege of developing a curriculum unit on the sun. . . . Children worked on independent research projects, parents joined them in creating dioramas (placed on display for school-wide viewing), students were engaged in learning the subject matter. We went on to win first-place in the district-wide science fair.

The theme of my [previous] unit was, "You can be a success despite your circumstances." . . . Students shared many of their difficulties. . . . We were able to connect and bond closer as a class because of this unit.

The unit I prepared last year was designed for a high school class. . . . I was transferred to a middle school. . . and decided to initiate my unit with my eighth grade students. The results were astonishing! I was amazed at how well my class did. . . . The class sought out historical information about Shakespeare, assembled the Globe Theater in groups, read the entire play. . . and even put on the play.

A teacher, given the opportunity to design a curriculum unit in its entirety, will present it to her students with great enthusiasm. . . . As you teach your unit, you tweak it and make it better and more appropriate for the particular class . . . . The students, in turn, naturally respond to your enthusiasm. . . . It is refreshing to be able to teach lessons that you have created, that you have invested a lot of time and effort in. I have found that my students have always enjoyed the units I teach and I am pleased to have access to other people's units.

This last quoted Fellow was one of several who expressed appreciation for units their colleagues had written earlier. Another said,

Through the Institute I have been exposed to many different teaching styles and lesson concepts, which I can incorporate. . . . My teaching will also benefit from greater use of the curriculum units published in previous years.

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*"A teacher, given the opportunity to design a curriculum unit in its entirety, will present it to her students with great enthusiasm. The students, in turn, naturally respond to your enthusiasm."*

*—Institute Fellow*

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Those units are among the extensive resources available on the Institute's Web sites, which are described later in this report.

### Participants' Conclusions Overall

We asked Fellows about the extent to which several features of the Institute had been useful to them. As shown in Chart 7 below (reading again left to right from the most useful to the least useful), very few Fellows said that any aspect of the Institute had not been useful. In fact, except for computer assistance — which many did not use — each aspect of the Institute was regarded as useful to a great or moderate extent by well over half of the Fellows. All responded that favorably about their seminar leaders and the knowledge gained about their subject, ninety-four (94) percent about the interaction with other Fellows, most also (88 percent) about the guidelines for writing a unit, and about the seminar bibliographies (79 percent). Every Fellow rated the program overall as useful at least to a moderate extent; most (86 percent) called it useful to a great extent.

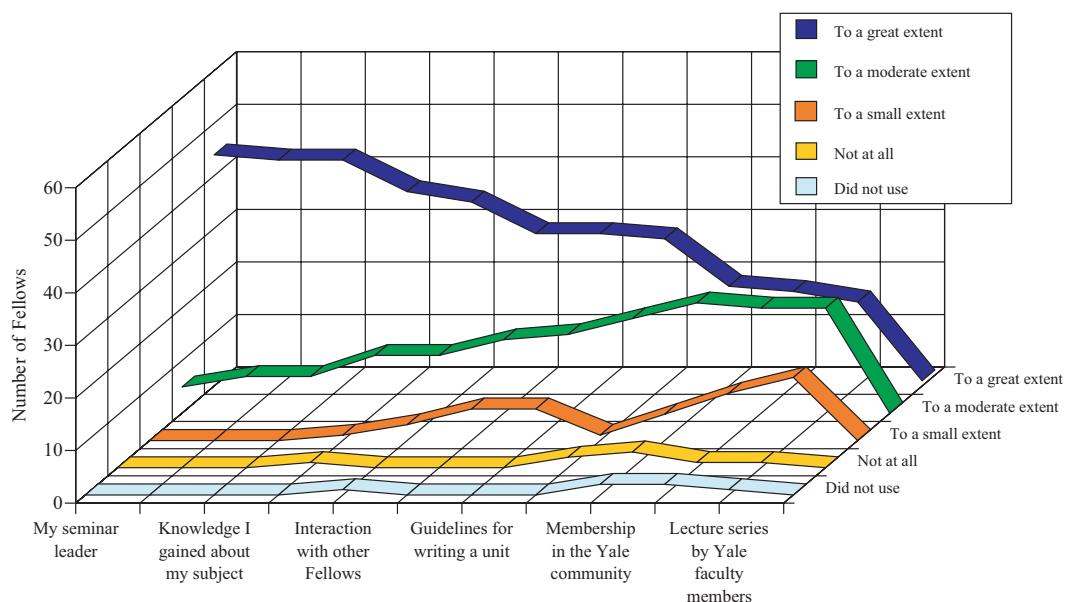
We asked the Yale faculty who led seminars to provide their conclusions about the strengths and weaknesses of the Institute. Overall, the leaders' assessment was strongly favorable.

One seminar leader who "think[s] highly" of the program believes "the number of teachers who return again and again suggests that it is filling a deep-seated need felt by the teachers themselves to enlarge and enrich the courses that they teach." Others said:

The context and history of the Institute serve as a significant channel for quality education in the public sector. The Institute's support

Chart 7

Program's Usefulness to the 2006 Fellows



*Well over half of the Fellows regarded each aspect of the Institute as useful to a great or moderate extent.*

and resources truly influence all the participating Fellows. . . . Not only are the goals of the Yale-New Haven Teachers Institute commendable, they have been consistently achieved with evolving strength and outreach. It is a significant resource and support for the public school system, both locally and nationally.

The main strength of the Institute is the long-term (several-month) relationship that develops among the leaders and the Fellows. The number and distribution of meetings gives ample opportunity for the leader to develop as an effective content expert and Fellows to articulate their claims as teaching experts. In this way a meaningful partnership can be achieved. Over the course of many seminars and many years, Yale and New Haven can work to mutual enhancement. The many years of experience at the Institute are evident in the smoothness with which it runs.

I expected this to be a profitable experience for me, and I got more than I expected. My work with the Fellows was invigorating and encouraging. I was impressed to see how such a complex program can be accomplished. The discipline that was imposed by the program administration was incredibly helpful in keeping me and the Fellows on task and working efficiently. The long experience of the Institute, and the lessons that the Institute leadership have learned through the years, was clearly a major strength.

We also asked Fellows about the strengths and weaknesses of the Institute. One respondent could "only think of positive things." Another described "the consistency of expectations" as a particular strength. One who has "immense respect and admiration for the Institute's work" called the experience "inspirational, having an effect on the content, methodology, and goals of my teaching." Another emphasized "working with our peers who are going through the same struggles" and "the interaction between us" as a "main strength." Similarly, another cited the "ability to interact with other teachers in a setting where creativity and optimism is appreciated" as "essential for my own stability this year." This Fellow, regarding the Institute as "a wonderful addition to the experience of a New Haven school teacher," continued on the theme of teacher leadership,

Teachers have input into the subjects of the seminars. . . . I like that the Institute listens to and responds to the teachers' input. This tends to be left out of many other professional development programs. The Institute offers professional development that causes the individual to grow and gain confidence.

Any deficiencies Fellows cited tended to concern the challenge of fulfilling the program's considerable requirements; as one wrote, "the only perceived weakness" was the "time commitment."

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*"I expected this to be a profitable experience for me, and I got more than I expected. My work with the Fellows was invigorating and encouraging. I was impressed to see how such a complex program can be accomplished."*

*—Seminar Leader*

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Another said, "For a first-timer and non-writer, it was difficult to find the most efficient way to put the unit together."

Most comments were highly positive. The same "first-timer and non-writer" listed the following "strengths":

To learn extensively about the topic, to hear speakers on other topics, to use the Yale facilities, to make new friends, to be supported and inspired by a Yale professor, to be published, to write useable and motivating curriculum, to receive financial help, and to be around an intellectually inspiring environment.

Others said:

The strengths of the Institute come from the faculty that participate and their level of commitment to the program. I have never participated in the Institute when there was not the highest degree of cordiality and enthusiasm. . . . The fact that you offer computer help and orientation to the libraries is also great.

The Institute offers teachers, both new and seasoned, many wonderful opportunities. Its strengths are many. I especially value being able to "study" under the direction of a Yale professor, interact with other teachers from different schools and grade levels, and design my own curriculum unit related to the seminar.

Aside from scattered concerns about details of scheduling and the workload to which we have alluded, the Institute's offerings were very well received. One Fellow said,

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*"The Institute gives teachers professional development that will enhance their teaching and the lives of their students."*

*—Institute Fellow*

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The Institute is a great program for teachers. You can get a Yale education and get paid for it! The real strength of the program is teachers supporting each other in a relaxed atmosphere. It seems the teachers who participate in the program are dedicated to their teaching. They love what they do. This enthusiasm is contagious and invigorating. Hence, I find the Institute to be therapeutic. One of the major problems in the teaching profession is a teacher working on his/her own island. The Institute gives teachers professional development that will enhance their teaching and the lives of their students.

In their evaluations, almost all the Fellows said they would participate (75 percent) or might participate (21 percent) in the Institute in one or more future years. These proportions are comparable to those in most prior years. Only two individuals said they would not participate in the future: One will not be "returning . . . because of my intended schedule . . . not because of the Institute," while the other planned to move out of state for personal reasons.

## Electronic Resources and Assistance

For a number of years the Institute has explored ways computing can assist with its work. In earlier years the Institute provided teachers computers to use in schools where none were otherwise available to them. It encouraged Fellows to learn about and use e-mail. And the Institute put the New Haven Public Schools' curriculum framework online before the district was able to do so. It placed Fellows' curriculum units online on a gopher server before the Internet existed in its present form.

More recently, as computers have become more widely available, if not ubiquitous; as teachers' use of e-mail has become more routine; and as Fellows' knowledge of computing has become more widespread; the Institute mainly has assisted Fellows in formatting their curriculum units in a manner consistent with its mechanical specifications for units so that they can more readily be put online on the Institute's Web site. Because of the benefits of having curriculum units online, the Representatives had decided that, beginning in 1999, Fellows must submit curriculum units and *Guide* entries in electronic as well as printed form. Still, in 2006 some Fellows sought help with more basic applications from getting started with computing, e-mail, and the Internet, to using the Internet in research and teaching, and using Institute resources online.

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*The Institute mainly has assisted Fellows in formatting their curriculum units so that they can more readily be put online on the Institute's Web site.*

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The Institute hires graduate and undergraduate students who offer this computing assistance by phone, by e-mail, or in person. In addition, Fellows may use computing facilities available to members of the University community across the campus. The electronic resources and services available to Fellows include opportunities to learn about and use computing. Perhaps most important, each Fellow receives a University network ID and password which enables them to use databases and other electronic resources available only to members of the Yale community.

With staff from the University Library, the Institute conducted a workshop for Fellows on March 22. This session featured an overview of search engines; exploration of curricular resources available through the Institute's Web site; and guidance on how to use online research tools of the Yale libraries, including databases and online journals. About this session one Fellow said,

I went to the initial seminar and learned how to use the library services and general information - from there I visited libraries or worked from home. It was nice to know the assistance would be there if I needed it.

The Fellows also sought computer assistance individually with word-processing, formatting and file handling for the preparation of curriculum units. A few asked about incorporating tables and images into what would become the printed version of their units. One quarter of the Fellows made use of assis-

tance in person, several (12 percent) by phone, and nearly half (48 percent) by e-mail. For half (53 percent) of Fellows the availability of computer services was an incentive to their participation. Most Fellows who did not use the computer assistance said they did not need it because they had previously acquired sufficient computer skills, or because they had other resources at home or school. A few said they did not do so because of time constraints.

Almost all who did take advantage of the assistance commented favorably. One said the assistant who "checked my unit specifications was extremely thorough. . . . I really appreciate that kind of attention to detail." Another wrote,

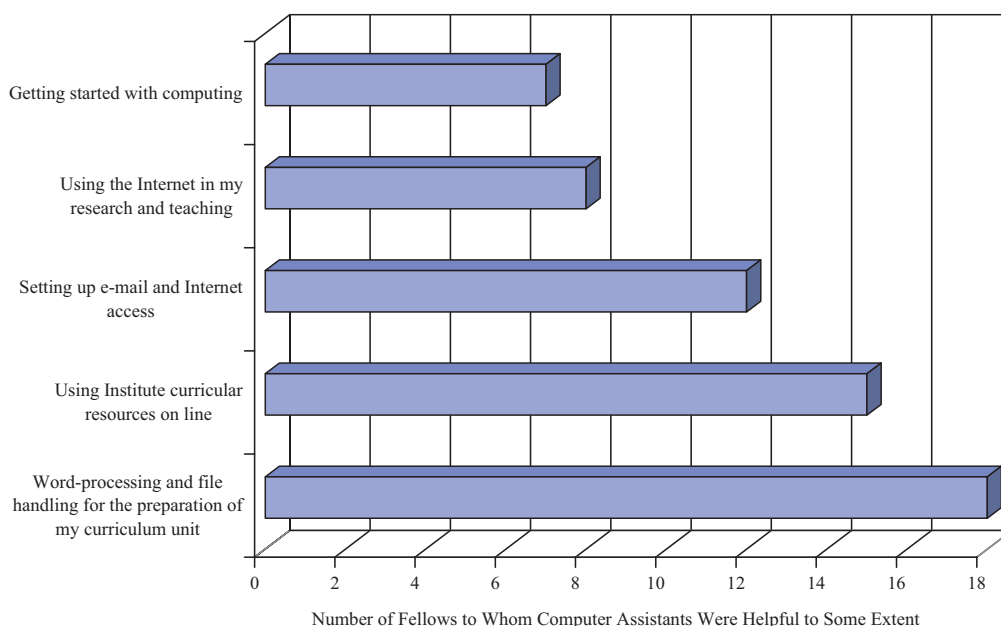
Computer assistance is quite wonderful, as there are many people (myself included) who are still learning. . . . The information packet first mailed to me . . . contain[ed] a lot of helpful information . . . . It was, however, great to have the computer team.

Returning Institute participants described how they had gained proficiency and confidence in computing over time. One said,

I did not use computer assistance this year because I used it in the past and I learned from prior mistakes. Each year I feel more comfortable writing a unit. I do however appreciate the corrections and comments that are made on our second drafts.

For the third year the Institute provided each seminar with its own e-mail group to facilitate communication. Some seminar leaders chose also to use

*Chart 8*  
Computer Assistants' Helpfulness to the 2006 Fellows



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*Almost all who did take advantage of the assistance commented favorably.*

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Yale's classes server for posting and viewing documents. One Fellow said a seminar leader "posted all the readings on the classes server . . . a very useful tool." Another wrote,

We had easy access to the reading through the Yale classes server and could easily download the readings to print them or just read them online; this method was much more convenient than being directed to read selections from the reserve shelf.

Of those using the additional computer assistance that the Institute provided, seven found the assistants helpful in getting started with computing; sixteen found them helpful in setting up e-mail and Internet access; fifteen found them helpful in using the Institute's curricular resources online; ten found them helpful in using the Internet in research and teaching; and nineteen found them helpful in word processing and file handling for the preparation of a curriculum unit. (See Chart 8.)

### Institute Centers for Curriculum and Professional Development

In 1996 the Institute undertook with the New Haven Public Schools a new activity designed to broaden and deepen its efforts to strengthen teaching and learning in the schools. It offered several elementary, middle, and high schools the opportunity to establish an Institute Center for Curriculum and Professional Development within their buildings. Five such Centers were established in 1996. Over subsequent years the Institute has articulated and refined the concept of the Centers, prepared policies and procedures for them, and designed, constructed, and delivered special furnishings to them.

The purpose of Centers is to provide Institute resources to assist teachers in implementing school plans that address district goals. The Institute aims to situate the Centers around the city, targeting especially the larger schools, so that a majority of New Haven teachers will have a Center at their school or at a school near them. During 2006, seven Centers were in operation. They were located at two elementary schools (Columbus and Davis Street), two K-8 schools (East Rock and Fair Haven), and three high schools (Cooperative Arts and Humanities, Hill Regional Career, and Wilbur Cross).

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*The purpose of Centers is to provide Institute resources to assist teachers in implementing school plans that address district goals.*

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These Centers are not permanent installations but must be regularly renewed. A Center may remain so long as the school has a need and desire for it, and can then be moved to another school. Moving Centers around the school district increases exposure to the Institute and ensures their resources will be located where they will be most beneficial each year. The Steering Committee, which makes these decisions, developed criteria for targeting sites: A suitable site must be of sufficient size, with a critical mass of participants and adequate leadership. It must be able to rely upon a favorably disposed school administration and an appropriate school plan, and be consistent with the aim of allowing most New Haven teachers to have a Center at their school or nearby.

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*The Centers create in schools a place conducive to the kinds of conversations teachers have with one another and with their Yale colleagues in Institute seminars.*

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The Institute and the New Haven Public Schools jointly established Institute Centers to support the system's curriculum reform efforts. The Centers help carry out school-based plans to address the District's "Kids First" goals for student learning, whose strategies include enhanced standards-based curriculum and instruction; "professional learning communities"; parent and community involvement; and improved physical condition of schools. The Centers create in schools a place conducive to the kinds of conversations teachers have with one another and with their Yale colleagues in Institute seminars. Centers increase the visibility and use of Institute resources and include teachers who have not before been Fellows. Fellows using Centers disseminate Institute-developed curriculum units and encourage other teachers to assist with planning Institute seminars and to participate in those seminars.

The Centers operate from attractive and properly equipped rooms in the schools, where the Institute installs special furnishings designed by Kent Bloomer, Adjunct Professor of Architectural Design at Yale, who has led three Institute seminars. Bloomer designed for each Center two pieces of furniture that remind the users that a Center is a way of bringing teachers together as colleagues, and that it is a function of the mutual presence of Yale in the schools and the schools in Yale. Combining utility and symbolism, these pieces have a solidity and elegance in harmony with the tradition of design at Yale University, and an evident durability suggestive of the Institute itself. One piece is a round table, with a hole in the middle, which provides the "center" about which eight people can sit. The center of the table is filled with a circular design, the Yale-New Haven Teachers Institute logo multiplied as a continuous fret, which is done in tile and set in cast metal for permanence. The second piece is a very high bookcase, designed to hold volumes of the curriculum units and other Institute materials, with hand-plated inlay work across the top that carries the same continuous fret depicting the Institute logo. A banner continues the logo of the fret into the room. Most Centers contain at least one computer so the teachers have easy access to the Institute's Web site and other online resources.

Schools interested in becoming a Center site must submit an application that is approved by the principal and school planning and management team, who agree to support and provide necessary resources to the Center. In 2006, a group of Center leaders, including one teacher from each of the seven Center schools, met periodically to provide peer review of the Centers operations and to exchange ideas on effective Center activities. These meetings were held on January 25 at Cooperative Arts and Humanities High School, June 8 at Columbus Family Academy, October 11 at Davis Street School, November 15 at Fair Haven School (preceded by an open house for teachers at that school), and December 13 at Cooperative Arts and Humanities.

The meetings provided an opportunity to discuss reports from each Center and to orient teachers new to the Center concept. They explained connections between the hundreds of Institute-developed curriculum units and the

academic standards and curricular priorities of the New Haven Public Schools and placed emphasis on ways the Centers can in support and engage beginning teachers.

Several examples illustrate Centers' activity. On November 8 the Center team in Wilbur Cross demonstrated Institute resources to colleagues there; this provided an occasion for past Fellows at the school to describe their Institute experiences. Earlier, on March 28, Wilbur Cross held an unveiling of a plaque recognizing all Fellows at the school. A similar event is planned for spring 2007 for Wilbur Cross, which continues to have a high level of teacher participation in Institute seminars. The Representative and other Center team members at the high school work together to increase their colleagues' awareness of the Institute's curricular resources and to encourage them to apply to become Fellows.

Fair Haven School uses its Center as a "collaboration corner" to promote collegiality and introduce teachers to ways that Institute-developed units support school plans. The Center team has created an attractive, comfortable space in a high-traffic area with a copier, where posters call attention to teachers who have been Fellows. Cooperative Arts and Humanities High School has created a similar display in its Center, which is in a lounge area that many teachers frequent.

With respect to Centers' efforts to support beginning teachers, the Career High School Center's Coordinator wrote,

The students have benefited from the Center's activities due to new teachers being able to access units that aid in providing a wealth of



Josiah H. Brown

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*Combining utility and symbolism, these pieces have a solidity and elegance in harmony with the tradition of design at Yale University, and an evident durability suggestive of the Institute itself.*

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*Institute Center for Curriculum and Professional Development in Davis Street School.  
(Clockwise from left: Center leaders Dina K. Secchiaroli, Jean E. Sutherland, Ralph E. Russo,  
Lucia Rafala, Waltrina D. Kirkland-Mullins, and Jacqueline E. Porter-Clinton.)*

resources to beginning teachers who are not well endowed with resources or with the knowledge of where to look for such resources. The beginning teachers have been able to infuse novel ideas into lessons that would help to engage the students in the material.

Similarly, the Coordinator for the Center in Columbus School wrote,

Many first-year teachers have struggled with resources, and finding books revolving around particular topics. I have always recommended that they look up that topic in the units, and use [Institute] resources to assist them with finding books connected to the topic. Our library media specialist has been a great help with this as well, as I have reminded her on several occasions to guide people in that direction.

The Coordinator at Columbus added more broadly,

Teachers in my school are always working together on projects based on curriculum. For example, we are currently trying to base our literacy block around our school's science-based instruction. . . . We are always using units to try and tie different pieces of information together with books and activities. . . . The students have benefited greatly from this. . . . the teachers are informed about the resources available for them, and are able to pass this knowledge on to their students. I have seen many teachers using activities and books that they later told me have come from the Institute's units.

At Davis Street School, geography and New Haven history are among the topics that teachers have pursued using Institute units. Three Davis teachers participated in Institute seminars in 2006; one who was a first-time Fellow became the school's Institute Representative in the fall. The Center Coordinator wrote:

The results of student efforts as they pertain to implemented units have been showcased throughout our school and used as a reference point for fellow instructors who are implementing similar curriculum. Earlier this year, for example, [one Fellow's] students created wonderful stories based on their study and readings. . . . [The] work was proudly displayed on the classroom bulletin board and principal's showcase bulletin board; parents and visitors clamored at the children's writing ability!

The units have been included as a required part of Davis' Comprehensive School Plan. These resources are used by Davis Street instructors across grade levels. . . . Students are/have been excited to be able to actively participate in curriculum unit activities.

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*"The units have been included as a required part of Davis' Comprehensive School Plan."*

*—Institute Fellow*

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Their work is showcased throughout our school, during special parent/teacher conferences and other presentations, community based venues (i.e., the Public Library, Gateway Center, the 4-H Club).

Of the school's effort to involve parents, the Coordinator wrote,

We have also continued to familiarize parents with Center resources during our first parent/teacher open house and during subsequent encounters. At our beginning of the school year parent-teacher orientation sessions, we encouraged participating Fellows to continue referring parents to these resources online; we have found that bibliographies contained in these resources help many of our parents gain background knowledge to support their children at home.

### Preparation for the Program in 2007

From June through August the Institute identified and approached the 56 teachers who would serve during the 2006-2007 school year as the 19 Representatives and 37 Contacts for their schools. (During 2005-2006, 85 teachers had served in these ways, 21 as Representatives and 64 as Contacts.) In 2006, the program's teacher leadership decided that returning to its earlier practice of having a smaller number of more closely involved teacher leaders made sense, a decision which substantially reduced the number of Contacts from the previous year. Representatives were selected according to recommendations of the teachers who served as seminar Coordinators and conversations they had with teachers who had served as Representatives in the past, with other Institute Fellows, and with some school principals. Because as a group the Coordinators had become acquainted with the Fellows in their seminars, they could consider all current Fellows for leadership positions, as they sought to ensure continuity while also including teachers who had not before served in these positions.

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*Because as a group the Coordinators had become acquainted with the Fellows in their seminars, they could consider all current Fellows for leadership positions.*

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The number of Representatives and Contacts is proportionate to the number of schools at each level. As the number of K-8 schools within the district has grown, the number of Institute leaders from those schools has increased. During 2005-06, 46 (54 percent) of the Representatives and Contacts were from elementary or K-8 schools, eight (9 percent) represented middle schools, four (5 percent) represented transitional schools, and 27 (32 percent) represented high schools. In 2006-07, 34 (61 percent) were from elementary or K-8 schools, two (4 percent) represented middle schools (of which there were only two in fall 2006), three (5 percent) represented transitional schools, and 17 (30 percent) represented high schools. Every school had at least one Contact or Representative to serve as a conduit for information to and from the Institute throughout the school year. Of the Representatives and Contacts, about 20 percent were black non-Hispanic, 73 percent were white non-Hispanic, and 7 percent were Hispanic — percentages that approximate the demographic composition of teachers in the district at large (See Table 1, page 26.)

Representatives meet twice monthly from September through December and weekly in January and February. They receive an honorarium for this work and agree in advance to participate in the program they are planning; Contacts perform many of the same functions but are not required to participate in meetings or to commit themselves to Institute participation. Through the Representatives and Contacts, the Institute ensures that all teachers throughout the school district may have an effective voice in shaping a program of curricular and staff development in which they will then have the opportunity to take part.

The Representatives' first meeting for the new school year was on September 5. On September 26, a reception for Representatives and Contacts attracted numerous Contacts, including several who were new to their Institute responsibilities. Between meetings, the Representatives communicate by phone and through school visits with the Contacts for whom they serve as liaison to the committee of Representatives. In these ways, their meetings compile information from, and distribute information to, teachers throughout the New Haven schools.

During the fall, as many as 126 teachers expressed interest in the seminars being planned for 2007. By December the Representatives had decided to offer five seminars: "American Voices: Listening to Fiction, Poetry, and Prose," to be led by Langdon L. Hammer, Professor of English and Chair, English Department; "Voyages in World History before 1500," to be led by Valerie Hansen, Professor of History; "Frontiers of Astronomy," to be led by

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*Through the Representatives and Contacts, the Institute ensures that all teachers throughout the school district may have an effective voice in shaping a program of curricular and staff development in which they will then have the opportunity to take part.*

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Michael Marsland

*Representatives meeting. (Clockwise from left: Associate Director Josiah H. Brown; Chrissy A. Bieler; Justin M. Boucher; Barbara C. Natale, Sara E. Thomas, Maria Cardalliguet Gómez-Málaga, Sandra K. Friday, Mary Lou L. Narowski, Melanie Wolf, Diane M. Huot, Marisa A. Ferrarese, Kenneth W. Spinka, Jennifer B. Esty, Huwerl Thornton, Matthew D. Cacopardo, Erica M. Mentone, Jacqueline E. Porter-Clinton, Judith D. Dixon, Shannon E. Oneto, and Ralph E. Russo.)*

Sarban Basu, Professor of Astronomy; "The Science of Natural Disasters," to be led by David Bercovici, Professor of Geophysics and Chair, Geology and Geophysics Department; and "Health and the Human Machine," to be led by W. Mark Saltzman, Goizueta Foundation Professor of Chemical and Biomedical Engineering and Chair, Biomedical Engineering Department.

### Program Documentation and Evaluation

Annual evaluations of the Teachers Institute indicate that it assists teachers and schools in specific ways, and that the results are cumulative. (See in particular *A Progress Report on Surveys Administered to New Haven Teachers, 1982-1990* [New Haven: Yale-New Haven Teachers Institute, 1992].) In the fall of 2006, the Institute updated its continuing study of New Haven teachers who have been Fellows. This study reveals the proportion of eligible teachers from each New Haven school and department who have participated, the number of times Fellows have completed the program, and whether Fellows have remained in teaching in New Haven.

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*Annual evaluations indicate that the results are cumulative.*

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Of the 613 New Haven teachers who have completed the program successfully at least once between 1978 and 2006, two hundred four (204), or 33 percent, were teaching in New Haven in October 2006. (Please see the Appendix for a list of all Fellows from 1978 through 2006.) An additional 24 (4 percent) held full-time administrative posts in the school system, most (18) as principal or assistant principal. There were 32 (5 percent) other former or current Fellows serving in capacities including Instructional Coach (10); Counselor (10); and Library Media Specialist (12). Thus 260 (42 percent) of all Fellows since 1978 were still working in the New Haven Public Schools. (One former Fellow was on leave.) Of the 204 Fellows who were teaching, 160 were teaching in the six core subject areas in the humanities and the sciences. The two fields with the largest number of Fellows were English (32 individuals) and science (28). Of the forty four Fellows teaching other subjects, the largest number taught special education (27, or 4 percent of all Fellows since 1978).

As Table 2 shows, 8 percent of current elementary grades teachers (in elementary, middle, and K-8 schools) in New Haven have completed successfully at least one year of the Institute. As Table 3 shows, 29 percent of New Haven high school teachers of subjects in the humanities and sciences, 29 percent of transitional school teachers, and 22 percent of middle grades teachers have also done so. The proportion of science teachers (28 percent) who have been Fellows is higher than in any other subject. A number of teachers have participated for two to fourteen years. Of the 204 Fellows still teaching in New Haven, about half (47 percent) have participated in the Institute once, 30 percent either two or three times, 18 percent four to six times, and 6 percent (14 individuals) between seven and fourteen times.

Of the 24 New Haven Public Schools administrators who have participated as Institute Fellows, three fifths (63 percent) participated once or twice;

*Table 2*  
Institute Fellows as a Percentage of Eligible  
New Haven *Elementary* Grades Teachers

Kindergarten	8%
Grade 1	5%
Grade 2	5%
Grade 3	8%
Grade 4	13%
Grade 5	6%
Grade 6	9%
<i>Total K - 6*</i>	8%

\*Does not include 12 individuals who teach special education, 3 who teach English/ESL, or 1 who teaches physical education in the elementary grades.

*Table 3*  
Institute Fellows as a Percentage of Eligible  
New Haven *Secondary* Grades Teachers

	Middle and K-8 Schools*	High Schools	Transitional Schools	Overall
English	23%	26%	0%	24%
History	14%	26%	0%	21%
Languages	16%	22%	67%	22%
Arts	21%	25%	0%	22%
Math	16%	19%	0%	17%
Science	28%	27%	40%	28%
Grade 7**	12%	n/a	n/a	12%
Grade 8**	0%	n/a	n/a	0%
Total	22%	29%	29%	27%

\*Grade 5 and grade 6 teachers in K-8 and middle schools are reported in Table 2.

\*\*Self-contained classroom teachers.

n/a = not applicable

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*The proportion of science teachers (28 percent) who have been Fellows is higher than in any other subject.*

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six (25 percent) participated three to five times; and three participated seven, nine, or twenty-three times. Having former Fellows in positions ranging from Assistant Principal and Principal at the school level, to Associate Superintendent, Director of Instruction and Curriculum Supervisor at the district level, has made the Institute more visible, and has encouraged teachers to participate. In fall 2006, ten of the district's forty-five schools had former Institute Fellows as principals; an additional six schools had assistant principals who were former Fellows. Overall, more than one third of New Haven

schools had former Institute Fellows in these administrative roles. One example is Wilbur Cross High School, an Institute Center school, whose principal and an assistant principal had been Fellows and which regularly has three-to-six teachers participating as Fellows.

In 1996 members of the National Advisory Committee had suggested that the Institute engage in fuller documentation of its work beyond the seminars themselves, and of the wider effects of its program in the school system. They believed they were hearing from teachers and staff about many valuable results of the Institute's work that should be documented in forms that could be made more widely available. The Institute is therefore now documenting its various activities more extensively. This Annual Report itself is a massive compilation of information and statistics drawn from a variety of sources, including the questionnaires completed by Fellows and seminar leaders; reporting by school Representatives and Institute Center leaders; the tracking of all previous Fellows; statistics from the New Haven Public Schools, demographic analyses; minutes of meetings; project reports; reports from the Centers; reports to funders; and entries in the Institute's Web site guest book. The work that provides material for this Report extends over the entire year, and the Report is available online.

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*More than one third  
of New Haven  
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## THE INSTITUTE AND INITIATIVE WEB SITES

Electronic versions of the Institute's curriculum units and other publications are available at the Yale-New Haven Teachers Institute and Yale National Initiative Web (<http://www.yale.edu/ynhti> and <http://teachers.yale.edu>, respectively). The New Haven Web site played an important role during the National Demonstration Project, as a link in its network of information and a model for the Web sites of other Teachers Institutes, and it remains essential as the Yale National Initiative proceeds. The full texts of almost all the curriculum units written in New Haven between 1978 and 2006, plus an *Index* and *Guide* to these units, are available online to teachers in New Haven and elsewhere. Information about the New Haven Institute (its brochures and most recent Annual Reports) is also available, as is the text of its periodical *On Common Ground*, which contains articles regarding school-university partnerships and is intended for a national audience. The Initiative also inaugurated in February 2004 a new Web site, which includes links to the New Haven Web site and to those of the other League Teachers Institutes. Many of the publications on the New Haven Web site, including PDF and HTML versions of the periodical, are available on the national Web site. That site also features extensive information on the Teachers Institute approach, the activity of the National Initiative, and news from the League of Teachers Institutes.

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*The Institute Web site has been visited by nearly six million different persons. Of these, approximately 1,083,000 visited during 2006, when the site registered about 7.5 million hits.*

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A "guest book" on both Web sites invites comments and suggestions. The national Web site also invites comments on specific curriculum units and provides other forms to solicit information from teachers, schools, colleges and universities interested in the Initiative. In recent years the New Haven site has been used by more and more people in many parts of this country and abroad — teachers from both public and private schools (including Fellows from other Teachers Institutes in the National Demonstration Project and the Yale National Initiative), school and university administrators, parents, volunteers, university professors, high school students, graduate students, librarians, military personnel, home-schoolers, local policy-makers, and others conducting research or having an interest in education. We estimate that from its inauguration in June 1998 through December 2006, this Web site has been visited by nearly six million different persons. Of these, approximately 1,083,000 visited during 2006, when the site registered about 7.5 million hits.

In 2006 we continued to hear from individuals in many countries. A partial list would include elementary and secondary school teachers, university professors, college students and researchers from Argentina, Australia, Canada, China, Denmark, the Dominican Republic, Egypt, Ethiopia, Germany, India, Ireland, Italy, Japan, Latvia, Lebanon, Luxembourg, Nepal, Nigeria, the Philippines, Qatar, Russia, and the United Kingdom. The comments that these online visitors submitted were nearly all complimentary, and a reminder of one way that the Institute is participating in Yale's globalization.

A teacher in Adelaide, Australia was "interested in teaching some of the content of three of your teaching units on heredity and genetics." A teacher in

East Yorkshire, England thanked us for a unit on the Aztecs which he said "will prove invaluable in my teaching in the next term." A college student in Sheffield, England wrote, "Excellent reading and information. I may now pass my exam on Thursday. Thank you." A freelance writer in Rome sought permission to draw upon an Institute-developed unit for a "book of photographs we are publishing on the bridges of Rome." She thanked us and concluded about the unit, "It's a beautifully written piece and sums up very well our own thinking about what bridges are." An English teacher who "work[s] for the Dominican air force" and "was just assigned to give a class to pilots" wrote us about a seminar volume on aerodynamics, described as "quite interesting and at this moment really helpful with my class." A faculty member at Russia's Petrozavodsk State University said, "I'm a Fulbright Scholar and your site has been helpful to me in teaching conversational English." A faculty member at Denmark's Jelling College of Education called the site "very interesting, inspiring and useful!" From Solroed, Denmark, a high school teacher wrote, "Your Web site is excellent and has given me many ideas on topics to teach in English as a second language as well as social sciences. Please keep up the good work!"

We received messages from across Canada. A Toronto woman who described herself as the "founder of the first Hispanic women network company in Ontario" thanked us saying, "I plan to read more on the subjects related to Latinas." A teacher in Milton, Ontario observed, "This Web site is a great resource for all teachers whether new or experienced." A guidance counselor at a Quebec high school called the site an "excellent resource." A student teacher enrolled at the University of British Columbia wrote, "The curriculum units are an awesome resource. I had some ideas for teaching a unit on ancient Greece and I really like being able to compare notes with sound unit plans from a reputable source. I love the easy to navigate layout." Another college student in Vancouver said,

The article used was the basis of my final oral presentation and semester paper. It was useful because it was understandable. I supplemented my project with books on the topic. I presented information on the topic that not even my instructor knew! Made points! I will be back to use your Web site again. I was impressed. Thank you.

Selected responses from other countries included the following. A college student in the Philippines praised the site's "exact" and "great information." A "federal policy maker" in Abuja, Nigeria described the online resources as "interesting." A "marketing professional" in Mumbai, India called the site, "very informative. I visit it to help me teach my daughter who is in the fourth grade." From elsewhere in India, a Hyderabad correspondent was especially interested in units concerning juvenile delinquency. One in Dublin, Ireland characterized the units as "brisk, informative and not overpowering." An American, "now working in the Middle East on developing schools and training teachers" for the Supreme Education Council of Qatar, wrote "I thank the

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*"I'm a Fulbright Scholar and your site has been helpful to me in teaching conversational English."*  
—Teacher from Petrozavodsk, Russia

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*"This Web site is a great resource for all teachers whether new or experienced."*  
—Teacher from Milton, Ontario

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*"I visit it to help me teach my daughter who is in the fourth grade."*  
—Parent from Mumbai, India

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Institute for its efforts and program which was adapted . . . in Pittsburgh. The program is working. I am interested in using some of the materials here."

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*"I have used many teacher lesson plans from this site."*

*—Teacher from Bennington, Vermont*

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From around the U.S. came similar statements concerning a wide range of disciplines. Nearby, a New Haven scientist and curriculum consultant said, "Good. More information related to local schools and activities related to the Teachers Institute will be a plus." A Plainfield, Connecticut teacher "looked at some of the units . . . and would like to use them in my classroom." An elementary teacher in East Hartland called the site "excellent." A high school teacher in North Kingstown, Rhode Island responded, "Great teaching units!" A Spanish teacher at a Montessori school in Lexington, Massachusetts wrote about her interest "in language learning at the elementary level." A teacher at Milton Academy in Massachusetts called the site a "wonderful, useful resource." From a teacher in Bennington, Vermont: "I have used many teacher lesson plans from this site. I teach World Literature (grade 10), British Literature (grade 12), and Film (9-12)."

An educational consultant in Mountainside, New Jersey said, "Your Web site has been an invaluable source of good information that I have been able to use in working with teachers." A teacher in Bogota, New Jersey wrote, "I teach eighth and ninth grade English. . . . You . . . gave me enough information where I could present a snapshot of what life was like during the war years. Thank you." A Rutgers graduate student wrote,

I have only learned about the Yale-New Haven Teachers Institute in the past few days. It is an amazing project, in my opinion, and I am going to tell friends who teach secondary school about it, as well as librarian friends/colleagues, about it. I was fortunate to get very good history/social studies instruction in high school, but not everyone does. Your project could help fix that!

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*"Since I began mentoring first-year high school teachers in 1999, I have referred all of them to this site. Your work has so many practical applications and is so helpful to young teachers."*

*—Staff Developer from Bronx, New York*

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From New York City, a "middle school learning specialist" found "the unit on biomes to be extremely helpful." She cited "the flora and fauna adaptations (nicely written)" and said, "the bibliography is stunning (so professional). I am about to research this site for other interesting material. I am very impressed." Another New York public school teacher "came across your Web site while researching the history of lynchings and race riots." A teacher at I.S. 92 in the Bronx said, "I find this site very informative and helpful. Thank you!" A middle school literacy coach in the Bronx wrote, "I have found many useful resources on this Web site. We are always looking for models of excellent curriculums to help guide us through the process in our school." Also in the Bronx, a staff developer at Preston High School wrote, "Since I began mentoring first-year high school teachers in 1999, I have referred all of them to this site. It enables neophytes to see how units are planned and also gives them resources that they can use in planning their own lessons/units. Your work has so many practical applications and is so helpful to young teachers. Thank you." In Manhattan, a faculty member at Hunter College wrote,

I have used your curriculum resources now for close to a decade. I value this work and now I am inspired to initiate a similar project with the New York City Department of Education in collaboration with the Hunter College School of Education."

A teacher in Philadelphia "found the lesson plan I had searched to be very useful and professional. Thank you!" The Union Latina president at Allegheny College in Pennsylvania consulted online units "so that the students and community here could continue to be educated on Latino culture." She continued, "This site, the concept behind this Institute and the people involved are amazing and are incredibly helpful. . . . your curriculums make learning fun!"

A Wilmington, Delaware teacher wrote, "Great resource. Thank you!" A Georgetown, Delaware "former teacher and grandmother" at Delaware Technical and Community College sought resources because of her "interest in helping children learn to write." A teacher in Centreville, Maryland "like[d] your U.S. history" resources. From Silver Spring, Maryland, an "after school program provider" wrote,

The lesson plans available through this online resource are incredibly thorough and sophisticated. I appreciate the care taken by their authors to relate material and topics with a culturally competent approach. Similarly the comprehensive presentation of the unit in its entirety makes its application easy. Thank you for providing this useful service to the public!

A teacher in Brookneal, Virginia sought permission "to use a lesson plan for our second graders on the Sioux." From Lancaster, Virginia: "Wonderful resource for me as a ninth grade English teacher!" A middle school administrator in Fort Mill, South Carolina wrote, "I am impressed with this Web site and the variety of units available for teachers. I would like to receive information about how to be a part of this program." A teacher in Suwannee, Georgia wrote, "This looks like it will be very helpful as I develop and teach writing strategies for high school students with disabilities." A parent and "volunteer instructor" who works for the State of Georgia called "the initiatives and innovations in teaching" on the Web site "fascinating to me. It also helps me keep a pulse on what my child could/should be learning at school." A teacher at Anniston Middle School in Alabama commented, "Excellent site. I am a first-time visitor and I stayed up for four hours reading the different information." A first-year teacher of English in Cordova, Alabama "found the information on this site helpful and informative." A college student in Dennis, Mississippi similarly cited "very helpful information." An administrator at the University of Southern Mississippi in Hattiesburg reported, "This is a wonderful resource! Keep up the good work!" A teacher at Florida's North Miami Beach Senior High School discovered the "Web site and it looks wonderful. I will be visiting often once the school year begins. I am also eager to share my find with my fellow language arts teachers." From Fort Myers, Florida:

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*"This site, the concept behind this Institute and the people involved are amazing and are incredibly helpful. . . . your curriculums make learning fun!"*

*—College student  
from Pennsylvania*

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*"Excellent site. I am a first-time visitor and I stayed up for four hours reading the different information."*

*—Teacher from  
Alabama*

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I am a special education teacher, but also a student working toward my masters. I stumbled across your Web site in looking for activities to help develop sensory awareness, and found so many very interesting and useful links — and the site was quite navigational and logical — as a matter of fact, I've added it to my favorites for future reference! Thank you!

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*"I have found your site to be extremely beneficial, especially in the area of science. I adapt the lessons to fit my class."*

*—Teacher from  
Decatur, Illinois*

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A teacher at Chicago's Kenwood Academy wrote, "I am impressed how simple and direct these lessons are. They allow individual flexibility to suit each classroom either through providing the content resources or the seed-idea for a lesson activity." From a teacher at the S.S.C.C. School of the Arts in Chicago: "Simply put, I am impressed!" A teacher in Decatur, Illinois said, "I have found your site to be extremely beneficial, especially in the area of science. I adapt the lessons to fit my class." A faculty member at Sanford-Brown College in Collinsville, Illinois commented, "Excellent information and very helpful. I'm specifically interested in multicultural teaching in addition to adult literacy. Thank you." An elementary education student at Northeastern Illinois University "found your Web site to be very helpful as I try to learn about subjects and issues related to education, especially in areas where I have little or no experience."

A high school teacher in Milwaukee, Wisconsin was "looking for ways to teach science through art. I found the curriculum on photography very interesting and plan to investigate this further as a means to teach concepts of light." From Columbus, Ohio, a student at Ohio Dominican University used Institute resources for a paper she was writing on "how African American youth are treated differently than American white youth." She said, "I am a returning student from 10 years ago, so you can see this means a lot to me. Thank you." A teacher in Browerville, Minnesota "found your curriculum very helpful." From Littleton, Colorado, a middle school teacher found the resources "very helpful as I work with gifted middle school students. Your site includes challenging and complex material." A teacher in Montrose, Colorado called the site "a wonderful resource." A staff person at the University of Colorado at Denver wrote, "I am visiting this site for research and ideas. It is very helpful. Thanks."

A middle school teacher in Tucson, Arizona "found a great lesson plan from the Institute via a mention in Education World; haven't really explored the site, but am putting it into my 'favorites' and looking forward to updates!" A Conway, Arkansas teacher "found many detailed ideas from your site." A teacher in Carl Junction, Missouri identified "interesting lesson plans," while a Missouri community college instructor called the site "great, for libraries too." An Ashland, Oregon student at Western International University wrote, "Your site is a wonderful source of information. . . invaluable to me in finding information that eluded me elsewhere." A high school teacher in Salt Lake City, Utah said the site included "good practical teaching lesson plans."

Many enthusiastic messages came from California. A student at Los Encinos School in Encino thanked an Institute Fellow for her science unit: "It was very helpful in doing research for my experiment comparing the crystallization of sucrose, sucralose, and aspartame, for my fourth grade class science project." A high school drama teacher in Sonoma thanked us "for the wonderful curriculum. . . . I enjoyed reading it and finding new resources. I would like to receive more of this type of information. It is very helpful." A middle school teacher in Big Oak Flat said, "I ran across your Web site while looking online for lesson plans for 6th grade Earth science. It has been very helpful and I plan to visit often." In Lancaster, a private school teacher said, "Great curriculum units." A middle school teacher in Long Beach was "impressed with the short story elements lesson plans." A high school teacher in Fontana used "a superb curriculum unit on improving character development and collaboration skills." A graduate of Stanford now teaching at a private school in San Jose wrote, "The unit is fabulous. I love that you have this up and that your program is a partnership between Yale (my eldest is a sophomore there now) and the New Haven school system."

Texas, too, was again a rich source of responses. A Corpus Christi teacher praised a "great lesson! I love to teach with classic literature." A North Mesquite teacher identified, "Great ideas for teaching health care careers and bioethics." A teacher at Southwest High School in San Antonio wrote, "Exciting units. . . found one via Google, then backed out . . . to find other plans." From the librarian at Presbyterian Pan American School in Kingsville: "I found your site by chance while searching for lesson plan information. Kudos to all at the Institute, it was just the cup of tea I needed." She added,

I often do double duty as a language arts (jack-of-all-trades/subjects) faculty member. This year I am being given 12th grade English, oh boy, what a to-do! I immediately thought of your Web site, because it is complete, no nonsense, and thorough. I have used the bibliographies for professional and student acquisitions. This year I must write a curriculum guide for English IV as well as lesson plans for the year and I know I will reference your site.

The Institute's Web site elicited other intriguing comments. "The articles are a great resource for college students!" said one. A "homeschool mother and math tutor" wrote about a particular curriculum unit "for use with a group of homeschooled students involved in an enrichment-type co-op" and "also would like to use it with a group of homeschooled students I have been working with in preparation for the math counts competition." In Flossmoor, Illinois, another home-schooling parent wrote, "This is a wonderful site that I refer to while planning my curriculum for my 14 and 9-year-old children as well as their classmates in our homeschooling group. Many thanks for making the site and your information so accessible." An assistant manager of a restaurant wrote, "My son is doing a report on discrimination [against] 19th century Irish immigrants. He is in 6th grade. This has been a great help." The superin-

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*"I ran across your Web site while looking online for lesson plans for 6th grade Earth science. It has been very helpful and I plan to visit often."*

*—Teacher from California*

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*"My son is doing a report on discrimination [against] 19th century Irish immigrants. He is in 6th grade. This has been a great help."*

*—Assistant Manager of a restaurant*

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*"This information  
[will] help many golf  
course superintendents  
learn about water  
quality and responsi-  
ble management."*

*—Superintendent  
of a golf course  
from Indiana*

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tendent of a golf course in Schererville, Indiana who was "presenting to a group of golf course superintendents" was impressed with ecology-related curriculum units on the site. He planned to use "this information [to] help many golf course superintendents learn about water quality and responsible management." From Tampa, Florida a respondent wrote to an Institute Fellow, "to express my sincere gratitude for all the information provided by you concerning our Taino roots. I agree there needs to be more texture in our books today concerning our roots! From one Puerto Rican woman to another." A Hawaiian "cultural specialist/artist/craftsman" at the University of Hawaii's continuing education/culture program in Kailua called the site "very helpful and informative in my research for adaptive/alternative methods for cultural arts and studies." A "paraprofessional getting a masters in teaching" at the Lummi Nation School in Bellingham, Washington wrote, "I happened on this Web site while searching for a unit on Coast Salish totem poles and I found it to have the most accurate and comprehensive information without bias and/or stereotyping — a difficult combination to find under 'Indians.'" A teacher with the Hopi Domestic Violence Program wrote,

I am a violence prevention educator for our Hopi people in Arizona. I found that your institute possesses valuable information that is very helpful in better understanding human behavior. I am especially interested in readings that focus on child development in relation to socialization skills and emotional learning.

Clearly the curriculum units prepared by Fellows of the Yale-New Haven Teachers Institute continue to demonstrate their usefulness in many different ways for teachers and others who are engaged within a wide range of subjects and who have received many kinds of preparation.

## CONCLUSION

In 2006 the Yale-New Haven Teachers Institute continued its New Haven program with renewed teacher leadership while participating in the Yale National Initiative to strengthen teaching in public schools, which is based on the efficacy of the New Haven program and the success of its National Demonstration Project.

Operating in New Haven for the 29th consecutive year, the Teachers Institute conducted a program of six seminars, three in the humanities and three in the sciences and mathematics. The Institute continued to involve and support beginning teachers in New Haven, and reinforced its Centers for Professional and Curriculum Development in certain schools. Its Web site remained among the most popular sites on the Yale server. The number of "unique visitors" exceeded one million. In these ways, the Institute assisted the school district's efforts to prepare and retain well-qualified teachers, and to develop resources to help implement school plans that address district goals, while disseminating the Teachers Institute approach nationally.

The Institute looks ahead to maintaining its local program as the best possible example of its approach to high-quality professional development for teachers that improves student achievement.



# APPENDIX

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Málaga  
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