DIRECTIONS: LEADING THE WAY IN PUBLIC EDUCATION
The mission of the Kenan Fellows Program for Curriculum and Leadership Development is to enhance curriculum relevance for the benefit of all students; engage teachers, business, and universities through unique professional collaboration; and promote growth opportunities for teachers and the teaching profession.

“A new vision of the teaching career is needed that rewards the knowledge and expertise of those who work closest to children as highly as the skills of those who work furthest away.”
— Linda Darling-Hammond
The United States, while still a huge economic engine, is losing ground to many other nations on several educational and economic indicators — from international K-12 assessments in science and mathematics; to graduate-level preparation in science, engineering, and computer technology; to national investments in research and in the development of new patents and products. The time to focus our attention, our time, and our resources on improving the essential economy-building disciplines — science, mathematics, engineering, and technology — is clearly upon us.

However, the number of people interested in — and well prepared for — careers in science, mathematics, engineering, and technology, including K-12 science and mathematics teaching, is diminishing, and that fact threatens America’s competitive edge in the increasingly knowledge-based global economy. The thinning numbers of students entering science and mathematics is among the major findings of the National Science Board, which every two years measures scientific and technical capacity worldwide by analyzing a range of national and international demographic, education, labor force, and research-and-development trends. [National Science Board. 2006. America’s Pressing Challenge — Building A Stronger Foundation, Washington, DC]

In 2000, the National Commission on Mathematics and Science Teaching for the 21st Century (informally known as the Glenn Commission, for Senator John Glenn, the chair of the Commission) released a report that emphasized good teaching as the key to improved student achievement. The Commission made three major recommendations (see center bar, right).

The science and mathematics disciplines are very dynamic fields, with knowledge growing exponentially. And, at an ever-increasing pace, the knowledge gains in these disciplines are being translated into breakthrough technologies and services in communications, transportation, energy, health care, and entertainment and in other areas that are drivers in our lives and in our economy. But, what is the system and where are the programs that assure our teachers remain current in their fields and can deliver a modern curriculum in the classroom? In the midst of this critical need is the Kenan Fellows Program for Curriculum and Leadership Development.

The Kenan Fellows Program is designed to identify exceptional teachers who want to continue to grow and develop in their understanding of the real “enterprise” of scientific research, and translate their new knowledge and insights into improved teaching and learning in their classrooms. Teachers link to practicing researchers, assist in conducting real research, and develop leading-edge curricula for themselves and other teachers to use. This program is an outstanding example of how faculty in universities can link directly with faculty in K-12 schools for the benefit of all.

As a lifelong science educator and teacher educator, I am honored to serve as inaugural chair of the Kenan Fellows Program Board of Advisors. In that role I will continue to advocate for the expansion of this outstanding model of professional development to more teachers across North Carolina.

Charles R. Coble, Ed.D.,
Chairman of the Board,
Kenan Fellows Program

GLENN COMMISSION REPORT RECOMMENDATIONS

GOAL 1: ESTABLISH AN ONGOING SYSTEM TO IMPROVE THE QUALITY OF MATHEMATICS AND SCIENCE TEACHING IN GRADES K-12.
Within the first goal of the Commission report, it was recommended that summer institutes be established to address the professional development needs of teachers. This points directly to the importance of the Kenan Fellows Program for North Carolina.

GOAL 2: INCREASE SIGNIFICANTLY THE NUMBER OF MATHEMATICS AND SCIENCE TEACHERS AND IMPROVE THE QUALITY OF THEIR PREPARATION.
UNC system president Erskine Bowles is leading an initiative to increase the number of teachers produced by system universities, especially in the sciences and mathematics.

GOAL 3: IMPROVE THE WORK ENVIRONMENT AND MAKE THE TEACHING PROFESSION MORE ATTRACTIVE FOR K-12 MATHEMATICS AND SCIENCE TEACHERS.
Governor Easley has shown strong leadership in trying to identify and address the working conditions in schools that lead to unnecessary turnover in the teaching force in North Carolina. Retaining high quality teachers is as important as measures taken to produce more teachers.

Charles R. Coble, Partner, The Third Mile Group, LLC
Dr. Charles Coble recently served as the Vice President for Policy Programs and Studies of the Education Commission of the States (ECS). Dr. Coble was Dean of the School of Education at East Carolina University for thirteen years before joining the University of North Carolina Office of the President in 1996. As Vice President for University-School Programs, Dr. Coble served as liaison with the fifteen UNC schools of education and was the University’s primary representative for all collaborative K-16 activities. In that capacity, Dr. Coble led the development of the University School Teacher Education Partnerships in all UNC teacher preparation institutions and organized the UNC Center for School Leadership Development, a confederation of eight high quality programs for the initial and continuing preparation of teachers and administrators. He has directed over $12M in grants and contracts and is the author or co-author of 10 books and over 70 published articles. Dr. Coble serves on key state and national committees related to teacher preparation and development and science education. Dr. Coble, a former teacher, has a bachelor’s degree in botany, a master’s degree in science education, and a doctorate in curriculum and instruction, all from the University of North Carolina at Chapel Hill.
It is my privilege to serve as the new director of the Kenan Fellows program. As the new director, my goal and promise is to assure that all Fellows are recognized for their elite status among the best and brightest public school teachers in North Carolina. My career in education has afforded me a variety of experiences that serve as a foundation for my continued work to advocate for teachers through the Kenan Fellows Program. Over the past six years, this important initiative has provided close to a hundred teachers with a unique, professional learning community that results in achieving measurable goals for students.

The Kenan Fellows Program has developed a strategic plan to expand the program across North Carolina. We will start by creating an Advisory Board under the outstanding leadership of Dr. Charles Coble. The initial expansion will focus on the Advantage West, Northeast, Eastern, and Southeast Economic Partnership Regions, which taken as a whole include North Carolina's most economically disadvantaged school districts. These regions also exhibit much higher teacher turnover rates, significant cultural upheaval through tobacco industry losses, and inadequately diverse teacher bases relative to large minority student populations.

At full capacity, the Kenan Fellows Program hopes to offer 50 new two-year fellowships coordinated on a biannual enrollment basis with a residential component for summer professional development activities. The Kenan Fellows Program expansion has already begun, and the current class of Kenan Fellows represents the first biannual Kenan Fellows Class. The next recruitment for the Kenan Fellows Class of 2010 will initiate in the fall of 2007. As part of the residential model, each summer, Kenan Fellows from around the state will join us in Raleigh to participate in our summer fellowship. Fellows will then return home to work with their Mentors within their respective regions and communities.

These changes in the program structure will enable the Kenan Fellows Program to engage more teachers in the program, offer more diversified opportunities for Kenan Fellows and Alumni, and enhance the operational and programmatic efficiency and effectiveness of the Kenan Fellows Program.

It is a great honor for me to lead this group of exceptional teachers into this new era of program expansion. This growth will bring with it exciting possibilities and unique challenges. Successful efforts such as the Kenan Fellows Program assure that, not only are quality curricula developed, but that our most talented teachers are retained in classrooms as well. I give you my word that, with your support and continued commitment to students, we will work together to bring this highly selective program’s reach to other outstanding teachers across our state. As we enhance the Kenan Fellows Program, I will be looking to you all for your input, insight, and active collaboration.

Thank you for your consideration and continued commitment to the Kenan Fellows Program for Curriculum and Leadership Development.

Valerie B. Brown-Schild, Ph.D.
Director, Kenan Fellows Program

Valerie B. Brown-Schild, Ph.D., Director of the Kenan Fellows Program at NC State University, has more than 25 years of experience in literacy studies, school reform, community-based advocacy, curriculum, and instruction. Dr. Brown-Schild has proven her ability to evaluate and implement educational reform programs with a specific emphasis on teacher professionalism and quality teaching, as well as strategies to assist a broad range of community groups addressing the needs of all students. Her areas of experience in reading instruction include serving as a Reading Recovery teacher and middle school reading resource teacher. In these leadership roles, she measured and analyzed student achievement data to inform her instruction and assure student success. As an adjunct professor in Literacy Studies at UNC-Chapel Hill and Meredith College and in other roles, she has recruited and educated others about educational policy and reform. Her dedication to motivating large groups of parents, as well as school and community leaders, to be engaged in public education reform is evident in her work on five of the Wake Education Partnership Summits, which have influenced the goal-setting of one of the largest school systems in the country.
My experience as a Kenan Fellow has been, without a doubt, the richest and most meaningful experience of my tenure as an educator. This experience has enabled me to develop my identity as a teacher-leader and has instilled within me the desire to live out that identity in the environment around me.

Central to cultivating my identity as a teacher-leader were my interactions with other Kenan Fellows. These teachers inspired me through their intelligence, wit, and passion for educating their students. The relationships I formed with these other Kenan Fellows — relationships that both challenged and encouraged me — provided me with a community in which my educational philosophies and practices could gain depth and breadth. This community of Fellows helped me to embrace my gifts and passions as a teacher-leader and prompted me to think about how I might be able to enact teacher-leadership within and beyond the walls of my school.

The Kenan Fellowship also helped me to grow as a teacher-leader by providing me with forums to interact with leaders in important spheres of society — the business community, the political community, and the educational and scientific research communities. It was empowering to have power-brokers, policy-makers, and renowned researchers listen to me, hear what I had to say, and engage in genuine productive dialogue. Because the Kenan Fellowship opened these doors for me and let me see myself as an individual who has something of value to say, I now have the confidence to give input to and seek the advice of these same people going forward.

Working with two wonderful mentors, Drs. Peter Kilpatrick and Christopher Daubert, at the Biomanufacturing Training and Education Center at NC State, also gave me a window to see into the world of cutting-edge science at the university. My mentors helped me to develop my project on viruses, showed me opportunities to pilot my project, and assisted in bridging my experiences in a high school classroom to the advances that were occurring in the scientific community. Working collaboratively with them and getting to know them was personally and professionally fulfilling.

Perhaps the most significant thing about my experience as a Kenan Fellow is that it is not an isolated, one-time experience, distinct from the rest of my life. Instead, it has equipped me with skills and tools that I carry with me and have been able to apply in new and exciting situations. For example, as a result of my Fellowship I have — among other things — designed a curricular unit on viruses for high school biology teachers in North Carolina, worked collaboratively to design a curriculum on avian influenza for the Poultry Science Department at NC State, served as Co-Chair of the Faculty Council at Durham School of the Arts, and joined the science education advisory committee at the Burroughs-Wellcome Fund. And all of this has happened within the past two years! The Kenan Fellowship has truly been a transformational experience for me — providing me with the skills and passion to develop and act upon my capacity for teacher-leadership.
An integral part of the Kenan Fellows program experience is the summer fellowship. Spending several consecutive weeks together with Mentors and with other Fellows provides unique opportunities for learning, discussion, and development. For two consecutive summers, all Kenan Fellows participate in a six-week summer fellowship. Time is spent during the summer on research, curriculum development and professional and leadership development. The fellowship offers a number of unique workshops and speakers, but it is also a time of first-rate relationship building. Participants are able to meet fellow teachers from different grade levels, different subject areas, and a mix of school districts that reflect North Carolina’s geographic, socioeconomic, and cultural diversity.

The summer fellowship allows Fellows to dedicate an uninterrupted block of time to working with their Mentors. For a minimum of three weeks, the team works on current research both within and outside the lab. Fellows gain valuable experiences working in a research facility. Together, the team develops a strategy for translating this research into valuable lesson tools that can be aligned with the state’s curriculum and disseminated via the Internet. This summer research collaboration offers valuable experience not only to the Fellow but to the Mentor as well. Mentors gain a stronger understanding and appreciation of the K-12 education profession. Building relationships such as these will continue to strengthen a knowledge sharing model whose benefits impact both K-12 and university students.

For the remaining three weeks of the summer fellowship, the program focuses on a variety of key areas in pedagogy and teacher leadership. Over the last several summers, Kenan Fellows have worked directly with some of the nation’s most renowned leaders in science and education. Kenan Fellows have:

- Participated in training workshops led by one of NSF’s Science Learning Centers, including renowned science education researchers such as Dr. John Bransford, professor at the University of Washington and author of How Students Learn.
- Partnered with the premier program, All Kinds of Minds, which offers tools to meet diverse learning needs of students.
- Traveled to Asheville to attend the NC Science Leadership Institute led by the NC Department of Public Instruction.
- Visited NASA Langley to meet with their education staff and obtain valuable NASA education materials
- Received training by local experts on website development, computational science, and a variety of curriculum design models

One of the most important aspects of being a Kenan Fellow is understanding the role of teacher leadership. Kenan Fellows are competitively selected because of their capacity for leadership. Through the program they further their skills by taking on even more responsibility, not only in their own schools and classrooms, but in wider spheres such as their communities and state government. Kenan Fellows have a responsibility to work for positive change for North Carolina education. During their summer fellowships, Fellows have the opportunity to discuss together many of the changes they feel are important. They are exposed to new issues that affect education statewide and even globally.

Proper training is a necessary tool for providing teachers with opportunities to succeed. In the past, summer training workshops have offered a variety of opportunities to meet the needs of a diverse population of teachers. Fellows have participated in writing workshops to assist with preparing research publications, news articles, grant proposals, media releases, and advocacy letters. They have participated in team building activities, computer and technology training, strategic planning, preparing presentations, and service learning.

The Kenan Fellows Program is proud and grateful for the excellent speakers and trainers who have participated in our summer programs. They have included not only some of the most influential supporters of North Carolina education but also some of the top educators in the state. Many have received a number of honors and awards throughout their teaching profession. Some of these teachers are our own alumni. We are proud to have our graduates continue to give back to the program and offer professional development opportunities to the new classes. Alumni have participated in the summer fellowship in a variety of ways, serving as education liaisons, offering training and advice on project development, offering support for pursuing National Board Certification, and inspiring their colleagues and the program staff to continue to strive for greatness.
A Kenan Fellow Mentor is a distinguished professor or research scientist at a nearby college, university, or research center. Each Fellow is assigned at least one Mentor who provides content coaching and support throughout the two-year fellowship. Mentors are equal partners in the development of the project and guide the Fellows in preparing their final product for statewide dissemination. If applicable, the Mentors offer Fellows access to their labs and resources as well as experiences in research.

Dr. JoAnn Burkholder, an associate professor of aquatic botany and marine sciences at NC State, has been a supporter of the program since its early stages. She has served as an advisor for the program and a reviewer for new applicants and has continued to be a valued supporter and Mentor for Fellows in the program. Dr. Burkholder currently works with Diane Whitaker of Southwest Guilford High School on a chemistry project entitled Analysis of Water Runoff and Its Implications for Aquatic Wildlife. Through this project, students use storm water collection data gained through authentic field studies, computer mapping, and modeling to better understand the relationship between abiotic factors and the health of aquatic habitats. This Mentor/Fellow collaboration has offered a mutually beneficial experience for both. Ms. Whitaker has had unique field and lab experience, joining Dr. Burkholder on her research vessel on the Neuse River. They have presented together at statewide conferences, and Dr. Burkholder has been a guest in the classroom on numerous occasions. Due to their exposure to this research, it is not unusual that Ms. Whitaker’s students would choose water quality research topics for science fair competitions. The true culmination of this Kenan Fellow/Mentor partnership came when Ms. Whitaker and two of her students were accepted by The North Carolina International Science Challenge (NCISC) to compete at the 2007 Beijing Youth Science Creation Competition (BYSCC) in China.

Dr. Masila Mutisya is an associate professor in the School of Education at North Carolina Central University in the Department of Curriculum, Instruction, and Professional Studies. His areas of expertise include diversity, multiculturalism, character education, and international education, as well as human growth and educational foundations. Dr. Mutisya is a Mentor for Fellow Matt Sears of Hillside High School, Durham County Public Schools. Mr. Sears is working on a virtual video game to enhance mathematics education entitled Algebra One for Everyone: A Virtual Web Based Game to Improve Student Comprehension. While Mr. Sears has figured out how to integrate x and y coordinate planes into his game, Dr. Mutisya has helped Matt integrate a multicultural component that will allow students to see virtual worlds from a unique perspective. In the game, a player will need to succeed at a number of challenges to actually “win” this game, but along the journey students will engage with characters of different nationalities and cultures.

The Astronomy in 3rd Grade Project is a collaboration between Duke University physicist Ronen Plesser and Durham County Public Schools teacher John Heffernan to create an engaging unit of inquiry-based lessons for students statewide, with web-based lesson support for teachers. Since the inception of the fellowship in June 2005, Plesser and Heffernan have coordinated the development of a 3rd grade inquiry-based Astronomy Unit Kit for over 60 Durham County teachers and taught two day-long workshops for over 10 schools in astronomy content and teaching methodology. In order to develop web-based curriculum, weekly videotaping of lessons has occurred in Heffernan’s classroom with the assistance of Plesser and Duke student volunteers.

**ARE YOU LOOKING FOR AN OUTREACH COMPONENT TO YOUR RESEARCH GRANT?**

The Kenan Fellows Program has been recognized by the National Science Foundation (NSF) as a model “Research Experience for Teachers (RET) site.” We can help those researchers applying to NSF who wish to include an “RET supplement” in a proposed or existing grant.

In addition, the Kenan Fellows model can be adapted to function as the K-12 outreach component of many other grant proposals to a range of government, corporate, and foundation sponsors. Please contact us at kenanfellows@ncsu.edu or 919.515.5118 for more information on how we might collaborate.

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**PARTNERING WITH MENTORS**

“After working in partnership with my University Mentors, I am well-informed. My Mentors guide me, and I in turn point other teachers toward technology resources, ideas, contacts, and more. I must admit it feels good.”

—2002 Kenan Fellow Pat Ligon

![Kenan Mentor Dr. Maria Oliver-Hoyo and 2002 Kenan Fellow Pat Ligon.](image)
Good teachers look for innovative ideas to get students interested in science and math and to cultivate that interest into a lifelong passion. The Kenan Fellows Program is committed to developing quality materials for K-12 teachers across North Carolina and the nation. We recognize that curriculum development is the highest form of professional development for teachers. We thus provide teachers with the training and expertise to develop content-rich, age-appropriate educational materials.

The curriculum component of the program is truly the link that connects all members. Teachers and studies tell us that limited time is the largest obstacle in school today. Teachers are eager to introduce more exciting, current materials into their classrooms, but they can only do so realistically if those materials are clearly aligned with the NC Standard Course of Study. For this reason, Kenan Fellows carefully craft new materials using the state's curriculum standards as their guide. Fellows recognize the significance of multidisciplinary units and coordinate with their colleagues to integrate additional subjects into their projects. Nancy Carty, for example, is the art teacher for Broughton High School in Wake County. Her project, The Sun, Moon, and Stars: Visual Connections Between Art and Science, explores biomimetics, a new field of study that looks at design and structure in nature to assist in engineering and product design solutions. During Ms. Carty's two-year fellowship, her students explored the frontiers of space, the history of flight, the constellations, and how humans have perceived the concept of time. Ms. Carty's own research involved her participation in the National Institute for Aeronautics conference, and close Mentorship from Dr. Skip Bollenbacher, Dr. Amber Vogel, and Betty Brown, all connected with the Destiny Traveling Science Learning Program at UNC and the Morehead Planetarium in Chapel Hill. Her students engaged with the NC Museum of Natural Sciences with her as a research opportunity for their projects. “Ultimately the goal of this project was to increase student awareness and appreciation for the incredible wonders of nature, and the importance of our role as custodians for our environment,” says Ms. Carty.

Each Kenan Fellow leaves a legacy to the program by developing innovative curriculum products for K-12 education. To date, the Kenan Fellows have developed approximately 70 websites, video games for education, and even a short educational film titled CO₂ and You (developed by Kenan Fellows Laura Berube and Sam Wheeler in partnership with scientists from the North Carolina Museum of Natural Sciences as a feature film for the museum).

Selected Kenan Fellows are currently participating in Highly Interactive Fun Internet Virtual Environments in Science (HIFIVES), a research grant led by the College of Education at NC State and funded by the National Science Foundation. Kenan Fellows and Alumni are developing online 3-D video games to help students get more excited about science and the opportunity for discovery. The end result will offer students the opportunity to collaborate with their peers and teachers to solve problems and look at science and math from a new perspective.

The accuracy and currency of these instructional materials are maintained on a regular basis by Kenan Fellows and program staff. All Kenan Fellows’ websites are free and accessible via the Internet. Each website is tracked for visitor hits and point of origination. Kenan Fellows’ websites continue to gain in popularity as our dissemination methods expand. Users from all over the world visit these sites daily.
HOW DO WE KNOW THE KENAN FELLOWS PROGRAM IS WORKING?

Program evaluation is a critical component of the Kenan Fellows Program, and formative and summative data provide staff with the evidence necessary to make effective programming decisions. An external evaluator works with staff to design and implement an evaluation plan that measures attainment of key program goals. Results are reported annually. Data collection is conveniently web-based, allowing Fellows to respond to surveys or use other data collection tools online via the secure Kenan Fellows website.

Data collected to date show that the program is significantly improving the teaching and leadership of Kenan Fellows. Leadership profile data captured show that:

- 93% of all Kenan Fellows remain in the classroom
- 61% have successfully secured grant funds
- 74% have presented their curriculum products at state, national and international conferences; teachers in more than 50 of North Carolina’s counties have participated in Fellow-led sessions.
- Fellows’ websites have attracted more than 300,000 “hits” by more than 128,000 visitors from across the globe.

Teacher Leadership and Professional Efficacy survey data show significant (P < .05) gains in Fellows’ perceptions of their leadership skills, as well as their:

- Belief that others perceive them as a teacher-leader
- Belief that they can successfully provide professional development to other teachers
- Efficacy in using innovative instructional strategies

As the Collazo research shown below illustrates, the program and the curricula developed by Fellows also yield positive learning outcomes for the students of Kenan Fellows. To further assess student impact, Fellows’ student achievement data from End-of-Grade and End-of-Course tests are being collected from the NC Department of Public Instruction. North Carolina’s new ABC Growth Model data provide evidence of teacher effectiveness by examining students’ expected versus actual growth in an academic year (similar to value-added approaches). In this context, Fellows’ data will be examined both before and after their participation in the program to determine program impact on their students’ academic achievement.

GAMING IN THE SCIENCE CLASSROOM — KIM COLLAZO, 2005 KENAN FELLOW

Classrooms today are packed with Digital Natives who go home from school and spend many hours interacting with each other online, multi-user worlds collaborating to defeat enemies and solve problems. Through my Kenan Fellowship, I was given the opportunity to create and enter those worlds with the hope that infusing science content within them would motivate students to learn.

Dr. Friction’s Lair, a virtual world in which fifth grade students collaborate to learn about various simple machines and other concepts of motion and force, was created in the fall of 2005. It was piloted with a group of 76 heterogeneously grouped fifth graders in the spring of 2006. Used as an introduction to the unit, students were given a scenario that the simple machine parts they had looked forward to manipulating had been stolen by the evil Dr. Friction. Students in turn would have to enter his virtual world, gathering facts and solving riddles, to regain the pieces. A pre and post-test of students’ concept knowledge was used to evaluate the success of the virtual game as a means of science instruction.

The results showed statistically significant gains (P < .05) for both males and females on the science concept test. The enthusiasm of the students was also very apparent, with many of them going to Dr. Friction’s Lair to play in the afternoons and evenings upon returning home. It was interesting to hear the students talk about interacting in the world together, and planning times to “join” each other to, in reality, learn science concepts!

Having taught science using a hands-on approach, and still having many Net Generation kids not entirely engaged, I am excited about the prospects of including the multi-user gaming format to meet the 21st century challenges of educating our students!
In the wake of the bold, unprecedented vision of North Carolina’s previous generation of leaders, since the 1950s North Carolina has attracted national and international corporations to do business and locate large facilities within the state. These corporations have come in part because of a steady supply of highly trained employees produced by our educational system. As the Kenan Fellows Program moves forward into the ever more highly technical, highly specialized future, our schools must continue to expose all students to higher levels of science, mathematics, and technology. To do that, we must enlist and retain exceptional teachers who understand our global challenges and are equipped to lead students into that future. The future direction of our corporations also depends in part on how well our schools can respond to the challenge of retaining inspired teachers who in turn inspire the students.

The Kenan Fellows program offers an innovative approach to this problem by engaging corporations in activities that meet not only corporate goals but also the social needs in the K-12 public school arena. We connect master teachers in science, technology, engineering, and math with world-renowned researchers to develop a strong curriculum for students while also providing these exemplary teachers with leadership opportunities. We give corporations the opportunity to make an investment in elite educators that ultimately leads to increased teacher retention and high student achievement. This in turn creates economically stronger and more viable communities.

Corporations across America have come to recognize the need to invest in their local communities both monetarily and socially. Responsible corporations make decisions based not only on financial factors such as profits or dividends, but also on the immediate and long-term social and environmental consequences of their activities. Responsible employers care about their communities.

Because public education contributes to the solid economic foundation within a community, public/private partnerships that include business, government, and academia are critical to the economic success of a community. The Kenan Fellows Program works to synergize the collaboration among these groups, which in turn results in students who are prepared to meet the demands of an internationally competitive workforce.

**CORPORATE PARTNERSHIP OPPORTUNITIES**

“There is a changing landscape in corporate philanthropy. Businesses are increasingly aligning charitable works with efforts to build their bottom line and please shareholders.”


IBM and the Kenan Fellows Program: A Corporate Partnership

IBM has been an active and important corporate partner of the Kenan Fellows Program since its inception. Representatives of IBM served on the original planning committee that developed the Kenan Fellows model, and the IBM RTP site was the host for the first Kenan Fellows award ceremony. IBM has also donated laptop computers to enable our teachers to meet the demands of developing web-based curriculum products for use in their classrooms.

This partnership has continued to grow over the years. For example, IBM hosted a recent Fireside Chat with IBM Senior State Executive Rusine Mitchell-Sinclair and NC State University Chancellor James Oblinger on the topic: Globalization — Preparing Our Students to Compete in the Global Economy.

IBM has awarded the Kenan Fellows Program an Innovation Grant to expand on this partnership. Together we are exploring the possibility of linking IBM’s TryScience website and curriculum into the classrooms we serve. As part of this effort to introduce TryScience and Grid Computing to our Kenan Fellows, Kenan Fellows alumni will participate in a training session. A summer workshop will also be developed for our new Fellows.

“IBM’s partnership with the Kenan Fellows Program is a great example of how our company can make an impact and help improve education in North Carolina,” said Tina Wilson, Corporate Community Relations Manager for IBM. “The Kenan Fellows are some of the leading teachers in North Carolina. We want to equip these leading teachers with innovative programs like TryScience, World Community Grid and IBM’s Reading Companion programs to show how technology can have a positive impact on the classroom and make learning fun and exciting for every student,” said Ms. Wilson.

For more information on IBM Community Relations programs visit [www.ibm.com/ibm/ibmgives](http://www.ibm.com/ibm/ibmgives)
On behalf of the hundreds of teachers and their students whom the program has served since 2000, the Kenan Fellows Program is grateful for the support and partnerships of a wide range of organizations and individuals. Many of these corporations and individuals are already committed to helping our statewide expansion plan succeed. We are currently engaged in a strategic, aggressive campaign to identify and enlist partners who can help build and sustain the Kenan Fellows Program to full capacity across North Carolina. You and your organization have the unique opportunity to be involved as critical partners with this innovative, proven initiative.

This brief retrospective has communicated the impact to date of this uniquely cost-effective, highly innovative program, which retains North Carolina’s very best teachers by engaging them in translating our universities’ research into more exciting, challenging, and globally competitive K-12 curricula. There are many wonderful professional development programs for teachers and at least as many K-12 curriculum development programs available. However, only the Kenan Fellows Program envisions these missions as symbiotic, and then creatively harnesses one of North Carolina’s greatest assets — our world-renowned research universities — to achieve this integration. Already we have indications that the Kenan Fellows Program is becoming nationally recognized as one of North Carolina’s flagship programs for quality teacher retention.

Whether you are a teacher, superintendent, principal, parent, local industry leader, civic organization member, university researcher or administrator, school board member, state senator, or state representative, you can help us systematically extend the opportunities of this program to teachers and students from each of North Carolina’s 100 counties, particularly your county. Transforming the Kenan Fellows Program vision into a reality will require a host of “ambassadors” willing to provide endorsements, and financial and in-kind support. We need help from such groups and individuals as:

- Federal granting agencies, government, and industry laboratories providing direct support for fellowships
- Universities and labs that provide venues for our Fellows’ work
- Committed university researchers, who can help Fellows develop the best learning resources for their students
- Local industries, foundations, and museums that can provide cash and in-kind support for many events critical to fostering dialogue between Fellows and statewide leaders
- Educational policymakers and leaders at the state, district, and school level who recognize the unique potential of the Kenan Fellows Program and will serve as advocates for continued funding and statewide expansion

Finally, for those who wish to make a direct cash contribution to support specific Kenan Fellows Program activities, we have enclosed a preaddressed envelope. You may also call 919-515-5118 to arrange to meet with the Director to discuss what level and type of support currently meets your organization’s or individual partnership goals. Working together, we can create a Kenan Fellows network across North Carolina from the mountains to the sea.
TEACHERS, ARE YOU AWARE OF THE MANY BENEFITS OF SERVING AS A KENAN FELLOW?

YOU CAN
- Be financially rewarded.
- Earn six graduate credits toward an advanced degree upon completion of the Fellowship.
- Develop professional and personal leadership skills.
- Engage in a two-year fellowship for leadership and curriculum development.
- Intern in corporate and/or university research centers in the summers.
- Work collaboratively with university and/or corporate scientist Mentors to create innovative instructional resources.
- Engage in dialogue regarding education issues with state and national leaders.
- Participate in special seminars and events to elevate the teaching profession.
- Receive support for obtaining National Board Certification.
- Present at state and national conferences to disseminate curriculum resources.

APPLY TO BE A KENAN FELLOW

The Kenan Fellows Program is a two-year fellowship with a biannual recruiting schedule. Kenan Fellow applications will be available online from November through mid-January during recruiting years starting in 2007. Nomination forms will be available online at www.kenanfellows.org

Kenan Fellowships are now available to all counties and school districts of North Carolina. Applicants must be public school teachers at the elementary, middle or high school level with a minimum of three years’ teaching experience. Teachers of all disciplines are encouraged to apply for Kenan Fellowships.

HOW TO BECOME A MENTOR

Mentoring is an excellent tool for professional learning both for the Mentor and the mentee. This opportunity for relationship building and professional growth is the foundation of the Kenan Fellows Program. Our program seeks Mentors from universities, corporate labs, and research institutions that bring rich experiences to the Fellowship. Throughout the two-year fellowship, Mentors expose Fellows to cutting research, new technologies, and lab practices, and collaborate to develop and implement new innovative K-12 classroom materials and teaching techniques. If you are interested in serving as a Mentor, then please visit our website at www.kenanfellows.org for an application.

MENTORS
- Provide enriching experience for the Fellow to enhance knowledge in content area.
- Expand Fellows’ skills in research, publishing, grant writing, networking, presenting, and entrepreneurship.
- Share equally in the development of innovative curriculum products and co-author a website to disseminate products statewide.
- Attend specific professional development sessions with the Fellows during the two summer six-week fellowships.
- Participate in special events sponsored by the Kenan Fellows Program.
KENAN FELLOWS PROGRAM FOR CURRICULUM AND LEADERSHIP DEVELOPMENT

PROJECTS TO DATE

2001

June Blackwell
"MANNNA" Project with Math and Industry
Sanderson High School, Wake County Public Schools
Mentor: Harriette Griffin, CPA, NC State

Julie Crain
Science and Science Fiction: Integrating Science and Literature
Fuquay-Varina High School, Wake County Public Schools
Mentors: Lisa Grable, Ph.D., and Hiller Spires, Ph.D., NC State

Pamela Lovin
Physics and Technology: Making Real Life Connections
Leesville Road High School, Wake County Public Schools
Mentor: Bob Beichner, Ph.D., NC State

Lisa McCurdy
Soil Inquiry & Environmental Ethics
C. W. Stanford Middle School, Orange County Schools
Mentor: Dan Richter, Ph.D., Duke University

Carolyn Moser
Making Connections for Environmental Education
Leesville Road Middle School, Wake County Public Schools
Mentors: Landise Spence, Ph.D., and Harriett Stubbs, Ph.D., NC State

Kevin Porch
Genomics & Bioinformatics
West Lake Middle School, Wake County Public Schools
Mentor: Bob Kelly, Ph.D., NC State

Judy Smith
Web Site for Foods and Nutrition
Southeast Raleigh High School, Wake County Public Schools
Mentor: Susan Butler, Ph.D., formerly of NC State

Shawna Young
Making the Environmental Science Connection
Hillside High School, Durham Public Schools
Mentor: Patricia Shane, Ph.D., UNC-Chapel Hill

2002

Laura Berube
Carbon Dioxide in Nature and Technology
Millbrook High School, Wake County Public Schools
Mentor: Bob Bruck, Ph.D., NC State

Denis DuBay, Ph.D.
Science as a Way of Knowing
Leesville Road High School, Wake County Public Schools
Mentors: John Penick, Ph.D., and Harriett Stubbs, Ph.D., NC State

Steven Gregory
Urban Space: Smart Place
Leesville Road Middle School, Wake County Public Schools
Mentor: David Stein, Ph.D., formerly of NC State

Holly Hanrahan
Destination: Mars
Carnage Middle School, Wake County Public Schools
Mentor: Fred Delarmente, Ph.D., NC State

Heidi Plenmon
The Big Dig: Earth Science and Excavation
Heritage Middle School, Wake County Public Schools
Mentor: Joe Carter, Ph.D., UNC-Chapel Hill

Patricia Ligon
Pharmacology, Biotechnology, & Forensics (with CO2 connection)
Broughton High School, Wake County Public Schools
Mentors: Stefan Fransen, Ph.D., and Maria Oliver Hoyo, Ph.D., NC State

Deborah Massengill
Carbon Dioxide in Nature and Technology
Enloe High School, Wake County Public Schools
Mentor: Bob Bruck, Ph.D., NC State

Judy Thibodeaux
Exploring the Universe through Astrobiology
C. W. Stanford Middle School, Orange County Schools
Mentor: Christopher Brown, Ph.D., NC State

Ashlie Thompson, Ph.D.
Using Problem Based Learning in the Science and English Classroom
Enloe High School, Wake County Public Schools
Mentor: Leigh Haefner, Ph.D., formerly of NC State

Sharon Winzeler
Painting Literacy: Man and the Environment
Broughton High School, Wake County Public Schools
Mentors: Lisa Grable, Ph.D., and Hiller Spires, Ph.D., NC State

Connie Woody
Math, Science Technology: Careers and Job Skills
Dillard Drive Middle School, Wake County Public Schools
Mentor: Dick Peterson, Ph.D., NC State

2003

Jason Bailey
Integrating Middle School Math into the Exploring Technology Curriculum
West Lake Middle School, Wake County Public Schools
Mentor: Dick Peterson, Ph.D., NC State

Nancy Carty
Sun, Moon & Stars: Visual Connections between Art & Science
Broughton High School, Wake County Public Schools
Mentors: Walter Bollenbacher, Ph.D., Amber Vogel, Ph.D., and Ms. Betty Brown, UNC-Chapel Hill

Michael Clinkscale
Interdisciplinary Math Curriculum
Utilizing Genomic Science Applications
Directors, Teach for America, NC State
Mentors: Ralph Dean, Ph.D., and David Haase, Ph.D., NC State

Charles Cobb, Ph.D.
Bioinformatics and Genomics in the High School Biology Curriculum
Southeast Raleigh High School, Wake County Public Schools
Mentors: Ralph Dean, Ph.D., Gary Payne, Ph.D., and Thomas Mitchell, Ph.D., NC State

Susan Hirsch
Advancing Biomolecular Science through an Integrated Curriculum
East Wake High School, Wake County Public Schools
Mentors: Walter Bollenbacher, Ph.D., Amber Vogel, Ph.D., and Ms. Betty Brown, UNC-Chapel Hill

Jan Schuettelpelz
Life: From Diversity to DNA
Durham School of the Arts, Durham Public Schools
Mentor: Patricia Shane, Ph.D., UNC-Chapel Hill

Randolph Senzig
Birds in the Schoolyard: An Interdisciplinary Approach to Environmental Science
Fuquay-Varina High School, Wake County Public Schools
Mentors: Stuart Pimm, Ph.D., and Dan Richter, Ph.D., Duke University, John Connors, NC Museum of Natural Sciences

Elizabeth Suber
Understanding Science through Career Exploration
Leesville Road Middle School, Wake County Public Schools
Mentor: Bob Beichner, Ph.D., NC State

Tracy Voreis
Life: From Diversity to DNA
Durham School of the Arts, Durham Public Schools
Mentor: Patricia Shane, Ph.D., UNC-Chapel Hill

Brian Wood
Advancing Biomolecular Science through an Integrated Curriculum and HiPIVES Gaming in Science
Enloe High School, Wake County Public Schools
Mentors: Walter Bollenbacher, Ph.D., Amber Vogel, Ph.D., and Ms. Betty Brown, UNC-Chapel Hill and Len Annetta, Ph.D., NC State

2004

Amy Davis
Integrating Science and Literature: Alcohol Effects on Health and Humankind
Wakefield High School, Wake County Public Schools
Mentors: Marianne Meeker, Ph.D., Amber Vogel Ph.D., and Walter Bollenbacher, Ph.D., UNC-Chapel Hill

Sam Fuerst
North Carolina Geology Online
Northern High School, Durham Public Schools
Mentors: P. D. Fullagar, Ph.D., and William Vail, Ph.D., UNC-Chapel Hill, David Lee, Wake Stone Corporation, and Tyler Clark, NC Geological Survey

Lynne Gronback
North Carolina Power Shift Initiative
Cedar Ridge High School, Orange County Schools
Mentors: William Schlesinger, Ph.D., Duke University, Pat Shane, Ph.D., UNC-Chapel Hill

Edward Kelley
Making Connections for Elementary Science Education
A.B. Combs Elementary School, Wake County Public Schools
Mentors: Alvin Braswell, Mary Ann Brittain, Barbara Beaman, and Ian Weems, NC Museum of Natural Sciences
KENAN FELLOWS PROGRAM FOR CURRICULUM AND LEADERSHIP DEVELOPMENT

PROJECTS TO DATE (CONTINUED)

Thomas Knott  
Integrating Technology: Linux in the Classroom  
Southeast Raleigh High School,  
Wake County Public Schools  
Mentor: Tom Miller, Ph.D., NC State  
and Cisco Systems and Red Hat

Dr. Kirtikumar Patel  
The Genetically and Culture of Rice in Africa and Asia  
Dillard Drive Middle School,  
Wake County Public Schools  
Mentors: Michael Purugganan, Ph.D.,  
and Betty Gardner, Ph.D., NC State

Paul Perryman  
Chemical Sciences: Formation of Tunable Coatings from Carbon Dioxide  
Jordan High School, Durham Public Schools  
Mentor: Jan Genzer, Ph.D., NC State

Dr. Gail Powell  
Environmental Science: Understanding Water Quality Issues  
Leesville Road Middle School,  
Wake County Public Schools  
Mentor: Joel Ducoste, Ph.D., NC State

John Pritchett  
Advanced Instructional Systems: Algebra I  
Millbrook High School, Wake County Public Schools  
Mentor: John Risley, Ph.D., NC State

Laura Stiles  
Biochemistry and Biophysics: Intracellular Protein Transport “A Day in the Life of a Protein”  
Wakefield High School, Wake County Public Schools  
Mentor: Howard Fried, Ph.D., UNC-Chapel Hill

Carol Swink  
Science Inquiry and Assessment  
Hunter GT Magnet Elementary School,  
Wake County Public Schools  
Mentors: Brenda Evans, NC ISE,  
Clara Stallings, NC Dept. of Public Instruction

Kelly Taft  
Junior Naturalist and NC Museum of Natural Sciences Green Education Center  
Moore Square Museum Magnet Middle School,  
Wake County Public Schools  
Mentors: Alvin Braswell and Mary Ann Brittain, NC Museum of Natural Sciences

2005

Antoinette Cheek  
GIS: Geometry Scene Investigation  
Southeast Guilford High School,  
Guilford County Schools  
Mentor: Eric Cheek, Ph.D., NC A&T State University

Kimberly Collazo  
Gamming in Science  
Deep River Elementary School, Lee County Schools  
Mentor: Len Annette, Ph.D., NC State

Jon Collins  
Computational Chemistry in the Classroom: Learning about Drug Design  
Cedar Ridge High School, Orange County Schools  
Mentor: Robert Gatwals, NC School of Science and Math  
and The Shodor Education Foundation

Erin Denniston, All Kinds of Minds  
Design Technology: Children’s Engineering  
McDougle Elementary School,  
Chapel Hill-Carrboro City Schools  
Mentor: David Ollis, Ph.D., NC State

Julie Durr  
Groundwater Hydrology  
WG Enloe High School,  
Wake County Public Schools  
Mentor: David Generreux, Ph.D., NC State

Katie Goeden  
Adventures of the Araunots  
Reedy Creek Middle School,  
Wake County Public Schools  
Mentors: Christopher Brown, Ph.D.,  
and Heike Winter Sederoff, Ph.D., NC State

John Heffernan  
Elementary Investigations in Astronomy and Light Forest View Elementary School,  
Durham Public Schools  
Mentor: Ronan Plesser, Ph.D., Duke University

Zebetta King  
Inquiry Guided Science in the Classroom  
Fred A. Olds Elementary School,  
Wake County Public Schools  
Mentor: Brenda Evans, North Carolina Infrastructure for Science

Gregory Mitchell  
The Biology and Historical Impact of Disease  
Durham School of the Arts, Durham Public Schools  
Mentors: Peter Kilpatrick, Ph.D.,  
and Christopher Daubert, Ph.D., NC State

Rice Strange  
Journal for Young Scientists  
Northwest Guilford High School,  
Guilford County Schools  
Mentors: Larry Allen, President, MagniFi Solutions, Inc.,  
and Robert Beichner, Ph.D., NC State

DeeDee Whitaker  
Analysis of Water Runoff and its Implications for Aquatic Wildlife  
Southwest Guilford High School,  
Guilford County Schools  
Mentor: JoAnn Burkholler, Ph.D., NC State

2006

Kelly Allen  
Chemistry Applications of Nanotechnology and Nanocrystalline Materials — a Gaming Simulation  
East Chapel Hill High School,  
Chapel Hill-Carrboro City Schools  
Mentors: Carl Koch, Ph.D.,  
and Ron Scattaggor, Ph.D., NC State

Lynn Chesnut  
Water Quality Research in North Carolina: Interactive Games for Formal and Informal Education In Science  
Rogers-Herr Middle School, Durham Public Schools  
Mentor: Shawnel Landavazo, Museum of Life and Science

Katheryn Cooper  
The Effects of Global Climate Change on Marine Ecology: A Game for Environmental Science  
High Point Central High School,  
Guilford County Schools  
Mentor: Rob Jackson, Ph.D., Duke University

Briana Corke  
Exploring Electricity through Non-Fiction Writing for English Language Learners  
Chapel Hill-Carrboro Elementary School,  
Chapel Hill-Carrboro City Schools  
Mentor: William Schmidt, Ph.D., Meredith College

Carrie Jones  
Analyzing North Carolina Water Quality Using GIS Technology In the Classroom: A Game for Earth and Environmental Science  
Middle Creek High School,  
Wake County Public Schools  
Mentor: Hugh Devine, Ph.D., NC State

Brad Miller  
Physics and Nanomaterials  
East Chapel Hill High School,  
Chapel Hill-Carrboro City Schools  
Mentors: Carl Koch, Ph.D.,  
and Ron Scattaggor, Ph.D., NC State

Roxanne Moses  
Science in Motor Sports: Safety Applications In NASCAR and Motor Sports Technology  
E. Mooresville Intermediate School,  
Mooresville Graded School District  
Mentors: Ed Maxa, Ph.D.,  
and Eric Klang, Ph.D., NC State  
and John Dodson of NASCAR

Chad Ogren  
Entomology and the Environment — A Virtual Gaming Experience  
WG Enloe High School,  
Wake County Public Schools  
Mentor: John Meyer, Ph.D., NC State

Jodi Riedel  
Sustainable Forestry: Promising Silviculture for Centuries  
Wakefield High School, Wake County Public Schools  
Mentor: Susan Moore, Ph.D., NC State

Stephen Roman  
Modeling in Chemistry: The Development of Atomic Theory: An Interactive Game Experience  
Lee County High School, Lee County Schools  
Mentor: Maria Oliver-Hoyo, Ph.D., NC State

Laura Ruble  
Plant Genomes: Understanding How Genes Code for Proteins — An Innovative Video Game for High School Biology  
Durham School of the Arts, Durham Public Schools  
Mentor: Steve Clouse, Ph.D., NC State

Matthew Sears  
Algebra I for Everyone: A Virtual Web-Based Game to Improve Student Comprehension and Relevance to Mathematics  
Hillside High School, Durham Public Schools  
Mentor: Musila Mutiya, Ph.D., NC Central University

Katherine Smyre  
A Day in the Park: Invasive Species and the Arts  
West Cary Middle School,  
Wake County Public Schools  
Mentors: Rita Hagevik, Ph.D., NC A&T,  
Joseph Covington, NC Museum of Art

Susan Taylor  
North Carolina’s Role within the Global Economy: A Resource for Economic Education  
Panther Creek High School,  
Wake County Public Schools  
Mentor: Daniel Phaneuf, Ph.D., NC State
KENAN INSTITUTE FOR ENGINEERING, TECHNOLOGY & SCIENCE LEADERSHIP TEAM AND STAFF

Ruben Carbonell  
Director

Rajeev Narayan  
Associate Director

Valerie Brown-Schild  
Director of the Kenan Fellows Program

Christopher Brown  
Director of the North Carolina Space Initiative

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