JOINT LEGISLATIVE EDUCATION OVERSIGHT COMMITTEE
AGENDA
February 8, 2006
9:00 A.M., ROOM 643 Legislative Office Building
Senator Swindell, presiding

Welcome and Introductions

Approve Minutes

June Atkinson, Superintendent of Public Instruction

Global Education (Behind Tab 4)

Dr. Kenneth E. Peacock, Chancellor, Appalachian State University
Millie Ravenel, Executive Director, The Center for International Understanding
Robert Phay, Director, World View – An International Program for Educators – The University of North Carolina at Chapel Hill
Dr. Delores Parker, Vice-President for Academic and Student Services, North Carolina Community College System
Dr. Elsie Leak, Associate Superintendent, Curriculum and School Support Services, Department of Public Instruction

Science Education (Behind Tab 5)

Dr. Elsie Leak, Associate Superintendent, Curriculum & School Support Services, DPI
Christine Boytos, Associate Director for Community and Business Management, GlaxoSmithKline, Inc.
Brenda Evans, Director, North Carolina Infrastructure for Science Education (NC-ISE)
Dr. Sam Houston, Jr., President and Chief Executive Officer, North Carolina Science, Mathematics, and Technology Education Center

LEA Consolidation

Adam Levinson, Fiscal Analyst, Fiscal Research Division

The North Carolina New Schools Project (Behind Tab 7)

Dr. Tony Habit, Executive Director, New Schools Project

NC Wise Update (Behind Tab 8)

Philip Price, Associate Superintendent, Financial & Business Services, DPI

JOINT LEGISLATIVE EDUCATION OVERSIGHT COMMITTEE
2005-2006 SESSION

February 8, 2006

TABS

MINUTES
JOINT LEGISLATIVE EDUCATION OVERSIGHT COMMITTEE
JANUARY 11, 2005

The Joint Legislative Education Oversight Committee met today, January 11, 2005 at 9:00 a.m. in Room 1228 of the Legislative Building. Representative Doug Yongue, Co-Chair presided over the meeting. The following members were present: Representative Grady, Co-Chair; Representatives Jeffus, Preston, Sauls, Tolson, and Warner. The following Senators were present, Senator A.B. Swindell, Co-Chair; and Senators Dannelly, Dorsett, Garwood, Hartsell, Malone, Moore, and Stevens. Please refer to attachments 1 and 2 for agenda and visitor registration.

The meeting began with a presentation by Mr. H.L. Reese, Associate Director, Industrial Extension Service, housed by North Carolina State University, College of Engineering. Mr. Reese provided committee members with a brief update on the progress and success of IES efforts and suggested that members keep this resource in mind when faced with manufacturing challenges. Questions were raised and answered. Please refer to attachment 3 for Mr. Reese's presentation in its entirety.

TEACHER LICENSURE REQUIREMENTS:

Chairman Yongue introduced Dr. Kathy Sullivan, Director of Human Resource Management/Quality Professionals, North Carolina Department of Public Instruction to address current teacher licensure requirements. Dr. Sullivan presented to the committee the various ways a prospective teacher could obtain a teaching license in North Carolina and what North Carolina is doing to comply with No Child Left Behind and the July 1, 2006 deadline. Please refer to attachments 4 and 5. Following Dr. Sullivan's presentation, Chairman Yongue asked three public school superintendents to report to the committee on the real-world effects of No Child Left Behind, insisting that each give a candid picture of the challenges they face in meeting the requirements and filling the classroom with highly qualified, licensed teachers.

TEACHER SHORTAGE – A VIEW FROM THE LEA'S:

Dr. Tom Daly, Superintendent, Martin County Schools, spoke to members about the challenges of filling the classroom. Dr. Daly must hire at least 49 new teachers each year. Of these teachers, 12 are lateral entry – which need a lot of support according to Dr. Daly. These lateral entry teachers are paying $800-$1000 per course in order to fulfill the course requirements. Dr. Daly asked members to consider this great expense. Dr. Daly also expressed to members that he would much rather have a licensed, experienced teacher from out-of-state over a lateral entry teacher with no prior teaching experience or education coursework.

Dr. Bill McNeal, Superintendent, Wake County Public Schools, addressed these same issues. Dr. McNeal informed members that Wake County must hire 1,100 teachers

annually as a result of growth (5,000+ students per year), teacher retires, and teacher losses or resignation. Wake County recruiters attend 200 job fairs per year, travel throughout the nation, and host two job fairs annually. Of the most recent pool of new teacher hires (1,119), forty six percent came from out-of-state. Over forty one percent of the new hires are beginning teachers, of which 70 teachers are lateral entry. Please refer to Dr. McNeal's presentation in its entirety in attachment 6. Dr. McNeal stressed the need for teacher reciprocity policy – to allow experienced, licensed teachers from out-of-state to move to North Carolina and teach without being forced to take a licensure test in NC. Dr. McNeal also explained that the Wake County School system would loose 1,000 teachers due to compliance issues with No Child Left Behind if the July 2006 date of compliance were not changed. Wake County, as of January 2005, still has 78 vacancies.

Mr. Allen Strickland, Superintendent, Hoke County Schools, was the last Superintendent to present. He initially expressed that his major concern is teacher recruitment and retention. In Leandro, the court deemed Hoke County Schools "hard to staff" with an extremely high attrition rate of 22%. The attrition rate was six percent higher the previous school year of 2002-2003. Hoke County has a 25.46% five-year teacher turnover rate - the highest in the state. Meanwhile, surrounding counties experience a teacher turnover rate of only 14% on average. Please refer to attachment 7 for Superintendent Strickland's remarks and additional facts.

All three Superintendents stressed the need to bring back retired teachers. The problem however is that North Carolina made an inquiry to the Internal Revenue Service (IRS) quite some time ago regarding the issue of a break–in-service. How long should this break-in-service be without jeopardizing the tax-exempt status of the state retirement system? The committee has tried several ways to make an inquiry and received no formal answer from the IRS. Following Superintendent Strickland's presentation, Senator Dannelly, and Representatives Grady, Jeffus, Pate, and Warner each inquired about this IRS response. Co-Chairman Grady explained the risk to members, while many members insisted that the committee follow-up and find a solution in order to fill these teacher vacancies with highly qualified, experienced teachers. The committee thoroughly discussed this issue and Chairman Yongue decided to pursue the issue further.

Senator Garwood asked each Superintendent to state one legislative priority. Dr. McNeal requested funding to recruit and retain teachers. Dr. Daly requested more funding for teacher salaries, expressing discontent with the salary scale. Superintendent Strickland requested funding to recruit and retain as well as funding for salaries.

SCHOOL CALENDAR CHANGES:

Mr. Phillip Price, Associate Superintendent for Financial and Business Services, NC DPI, first reported on the scheduling of and purposes of non-instructional teacher workdays in accordance with Session Law 2004-180, House Bill 1464 enacted on July 18, 2004. Mr. Price initially discussed the changes brought about by the legislation – citing as well as the results of two studies conducted. One study entitled "Online Teacher Non-Instructional Workday Survey" surveyed interest stakeholders. Interested

stakeholders, as defined by the legislation, include members of local boards of education, school administrators, teachers, parents, and any others that the State Board of Education deems appropriate. The Local Education Agency (LEA) Calendar Survey targeted central office administrators. Please refer to the findings as well as the legislation in *attachment 8*. Year round schools and modified calendar schools are automatically exempted from the requirements of the legislation. Mr. Price explained, in response to Senator Dorsett's inquiry, that in some cases individual schools within a Local Education Agency (LEA) requested a waiver, where as in other cases – an entire LEA requested a waiver.

Ms. Leanne Winner, Director of Governmental Relations, NC School Boards Association spoke to the committee on the challenges of local school boards in complying with the legislation and adopting new calendars. These challenges pose both scheduling difficulty and financial difficulty. Please refer to *attachment 9* for Ms. Winner's presentation in its entirety.

Ms. Katherine Joyce, Assistant Executive Director, North Carolina Association of School Administrators, addressed the committee on the consequences of the school calendar legislation and its effect. Ms. Joyce cited Wilson County as an example. This LEA will start school on August 25, 2005 and end on June 7, 2006. Teachers have already complained to their Superintendent at the loss of teacher workdays in the months of September, February, and May. Christmas break will be shorter as a result of limited flexibility in scheduling. Because the first semester will not end until two weeks after Christmas break, according to Ms. Joyce, students must study for exams over their break.

Overall, Ms. Joyce focused on the unpopular changes brought about by the legislation. Contrary to the bill's main supporters - Ms. Joyce predicted that tourism revenues would not boom like expected. She briefly mentioned the problems posed by the calendars of public schools and community colleges being out-of-sync. Many school systems express a Catch-22 situation. Scotland County filed an educational purpose waiver for all 15 schools in the LEA. Only the high school was approved. This poses several problems – both logistical and financial. On one hand, the high schools are now in sync with the community colleges. However, transportation costs are getting out of hand for the school system. There were no questions following her remarks. Please refer to *attachment 10*.

Superintendent McNeal, Wake County School System, spoke to the committee from the grassroots level on the effects. Wake County schools with a year-round calendar, modified calendar, and a traditional calendar. However, there is no flexibility, according to Superintendent McNeal. He expressed to the committee that one size does not fit all. In addition, Superintendent McNeal, spoke on one of the unintended consequences of the legislation – the prepay payroll requirement. Because federal law restricts the LEA from using federal funds to prepay teachers for the month of August, he must use the local spending flexibility to pay teachers and then wait for the reimbursement. Superintendent McNeal said the legislation would cost the Wake County school system $640,000. Prepayment could also result in overpayment. Dr. McNeal suggested there was no instructional value in the state mandated changes.

Superintendent Tom Daly, Martin County Schools followed by explaining the effects of the calendar legislation on high school students. These students would normally be taking college credits at a nearby community college with an in-sync calendar because they share vocational education classes with the community colleges. Superintendent Daly insists that they cannot afford to hire enough of teachers to replace the instruction they are loosing by not be able to utilize the community college and its resources. There were no questions to follow.

Finally, Eddie Davis, President of NCAE, testified on the so-called positives of the calendar legislation. Mr. Davis suggested that NCAE would use the month of August to offer better professional development. In addition, Mr. Davis expressed that his organization originally opposed the bill but then favored the legislation when members of NCAE expressed their support. Mr. Davis asked the committee to give the legislation a chance. There were no questions to follow.

LEGISLATIVE AND BUDGET PRIORITIES:

Mr. Martin Lancaster, President of the NC Community College System first proposed their twelve legislative priorities for the upcoming 2005 session, *attachment 11.* Mr. Lancaster then presented the 2005-2007 Expansion Budget Request, *attachment 12.*

Dr. Molly Broad, President of the North Carolina University system, presented the 2005-2007 Budget Request of the Board of Governors and the University of North Carolina, *attachment 13.* The budget is comprised of a continuation budget, affordable access, salaries, and improvements and expansion. Following this presentation of the budget request, Dr. Broad presented the 2005 Board of Governors: Non-Budget Legislative Initiatives, *attachment 14.* Dr. Broad expressed her intent and dedication to produce quality teachers for the classrooms of North Carolina schools. In closing, at the request of Senator Garwood, members applauded Dr. Broad for her recent election as President of the National Association of State Universities.

Chairman Howard Lee, North Carolina State Board of Education, presented the State Board of Education Budget and Policy Priorities for the state's public school system, *attachment 15.*

With no further business, the committee adjourned at 1:35 p.m. following Chairman Lee's presentation to reconvene at 10:00 a.m. on January 12, 2005.

MINUTES
JOINT LEGISLATIVE EDUCATION OVERSIGHT COMMITTEE
JANUARY 12, 2005

The Joint Legislative Education Oversight Committee reconvened today, January 12, 2005 at 10:00 a.m. in Room 1228 of the Legislative Building. The following members were present: Chairman Yongue, and Representatives Bell, Grady (Co-Chair), Jeffus, Pate, Preston, Sauls, Warner; Senators Swindell(Co-Chair), Dannelly, Dorsett, Garwood, Hartsell, Malone, Moore, Stevens. Chairman Doug Yongue called the meeting to order. Please refer to *attachments 1 and 2* for visitor registration and attendance.

Chairman Yongue began by reporting to the committee on the Leandro hearing on January 11 in the afternoon that he and Senator Malone attended. Judge Howard Manning who handed down the Leandro ruling held the hearing to discuss the enforcement of Leandro. He asked the State Board of Education to develop a plan to meet the requirements of Leandro with a budget attached. Chairman Yongue informed members of Judge Manning's sentiment by saying that the Disadvantaged Student Supplemental Fund would not be enough. He also said that the current ADM funding formula would not be sufficient. Judge Manning insisted, according to Chairman Yongue, that the individual schools and students be examined.

COMMUNITY COLLEGE FUNDING FORMULA STUDY:

Chairman Yongue invited the first presenter, Mr. Kennon Briggs, Vice President for Business and Finance, North Carolina Community College System (NCCCS) to discuss a preliminary report on the efficiency of the funding formula. This comes as a result of concerns to meet the costs of enrollment growth, considering the loss of manufacturing jobs in the state. In addition, the study was ordered to address high-cost needs, such as the cost to graduate quality nurses and other Allied Health professionals to keep up with industry needs. Mr. Briggs referred to House Bill 1414, Section 8.13, which directed the State Board of Community Colleges to consider modifications to its funding formulas in order to more accurately and effectively address enrollment growth and high cost programs, *attachment 16*. The NCCCS brought in an independent consultant to study the existing formulas. Please refer to "Overview and Purpose of the Study" in attachment 16. As a result of the two-part study, the consultant, along with the State Board of Community Colleges, suggested a total of seven recommendations to the committee. Chairman Yongue opened the floor to questions. Senator Swindell emphasized to committee members, as a member of a community college board of trustees, the aid to students with need in high-cost programs that is provided by private field-related associations. Chairman Yongue in turn asked Mr. Briggs what problems the NCCCS faces in acquiring and accepting state-of-the-art equipment for instructional needs. Mr. Briggs expressed the legislative need to clarify the Umstead Act in order to attract more equipment to the campuses. In this legislative proposal, Mr. Briggs asked members to pass legislation that would allow industry to donate state-of-the-art equipment for instructional purposes. In turn, the NCCCS would allow industry officials to visit the classroom with clients and observe how this equipment performs in the classroom. With

no further questions, Chairman Yongue invited the next presenters, Mr. Peter Hans and Mr. Stuart Fountain.

UNC / NCCCS PARTNERSHIPS TASK FORCE FINAL REPORT:

Mr. Peter Hans, Member, University of North Carolina Board of Governors and Co-Chair, UNC/NCCCS Partnerships Task Force gave members a short history on the establishment of the task force and purpose to create a seamless and collaborative relationship between the two entities. Please see *attachment 17* for this presentation in its entirety. Mr. Stuart Fountain, Member of North Carolina State Board of Community Colleges and Co-Chair of the UNC/NCCCS Partnerships Task Force presented the recommendations of the task force. Please see *attachment 18*. Chairman Yongue opened the floor to questions from members. Senator Dorsett and Representative Grady each inquired and commented on the possibility of admitting community college transfer students to the university while skipping the application process. Mr. Fountain and Mr. Hans said that the NC Community College Board I schedule to discuss that issue at a meeting later in January. Chairman Yongue asked for a future status report from the NCCCS regarding the money appropriated to the NC Automobile Dealers' Association to address the shortage of automobile mechanics.

COMMITTEE REPORT AND FINDINGS:

Chairman Yongue asked Robin Johnson, Committee Staff Attorney, to present the draft report and findings to the committee. Ms. Johnson read from the draft report a number of policy changes that the committee expressed interest in pursuing in the upcoming legislative session. Please refer to the report in *attachment 18*.

After some discussion among the committee, Chairman Yongue asked for a motion to include reciprocity in the findings. The motion carried.

Chairman Yongue then asked for motion to include guaranteed admission. The motion carried.

Chairman Yongue asked for a motion to concur with Judge Manning and keep low-wealth funding separate from disadvantaged student supplemental funding. The motion carried.

Chairman Yongue then asked for a motion to adopt the recommended changes and approve the findings of the committee. Representative Alex Warner made the motion. The motion carried unanimously.

With a motion from Senator Swindell, a second from Representative Pate, Chairman Yongue moved for the approval of minutes for March, April, and October of 2004. The motion carried unanimously.

Members recognized that Senator Moore and Representative Alex Warner would not be returning in the 2005 session and applauded them for their public service. Representative Warner praised the committee for their service as did Senator Moore. Chairman Yongue then recognized Ms. Charlotte Todd, Fiscal Research, who would be retiring soon. The committee expressed their thanks to Ms. Todd for her dedication and professional work. In closing, Chairman Yongue announced the informal meeting to follow at 3:00 p.m. at the Center for School Leadership and Development, UNC in Chapel Hill, NC. Chairman Yongue recessed at 11:45 a.m. to reconvene later today.

COLLEGE FOUNDATION OF NC (CFNC) DEMONSTRATION:

The Joint Legislative Education Oversight Committee reconvened at 3:00 p.m. for a presentation on CFNC and an informal roundtable discussion with President Molly Broad and the sixteen UNC Chancellors. Members attending were: Chairman Yongue, Representatives Bell, Pate, Preston, Sauls, as well as, Senators Swindell, Garwood, Hagan, Hartsell, Malone, and Moore.

President Broad opened up by stressing the priority to improve and increase access to higher education. President Broad introduced Bobby Kanoy, who then introduced George Dixon, Brian Williams, and Margaret Causey.

Mr. Kanoy briefed members on the legislative origin and funding of CFNC. The program was funded by the General Assembly in 1999 under the Pathways Partnership with additional federal funding and private funding sources as well. The Pathways Partnership consisted of the following members: Mike Ward, Department of Public Instruction; Mr. Martin Lancaster, NC Community College System; Hope Williams, NC Independent Colleges and Universities; Steve Brooks, State Education Assistance Authority; and representation from the State Occupational Information and Coordination Committee. Brian Williams gave members a step-by-step demonstration of the cfnc.org website.

Following the presentation, members talked informally about reducing the teacher shortage. Chairman Yongue adjourned the committee at 5:15 p.m.

MINUTES
JOINT LEGISLATIVE EDUCATION OVERSIGHT COMMITTEE
2003-2004 Session
December 15, 2004

The Joint Legislative Education Oversight Committee met on Wednesday, December 15, 2004 in Room 544 of the Legislative Office Building. Senator A. B. Swindell presided and convened the meeting at 9 a.m. Members in attendance were Co-chairs Rep. Doug Yongue and Rep. Robert Grady; Senators Dannelly, Garwood, Malone, Moore and Stevens; Representatives Bell, Insko, Jeffus, Pate, Preston, Sauls, Tolson and Warner. Members of the Fiscal Research Division were in attendance and a copy of the Agenda and the Visitor Registration Sheets are attached.

Chairman Swindell welcomed members, staff and acknowledged special guests, Acting Superintendent of Public Instruction Tricia Willoughby and Superintendent-Elect of Public Instruction June Atkinson. The Chair proceeded with the agenda and recognized Millie Ravenel, Executive Director of the NC Center for International Understanding.

Ms. Ravenel informed members that the Center for International Understanding was a public-service program of The University of North Carolina, which had taken more than 7,500 North Carolina students to 47 different countries in the World since it began in 1979. She explained that the Center offered a unique blend of Amerasian programs abroad, coupled with study and training in North Carolina. The Center worked closely with policy leaders and educators to provide expertise and tools, to ensure North Carolina's communities, schools and State handle changes associated with an increasingly interdependent world. Ms. Ravenel explained a K-12 program, entitled *"North Carolina and the World,"* which was implemented through a coalition consisting of more than 80 leaders and practitioners from across the State. She advised that the coalition members identified four areas, which they felt would move North Carolina toward excellence in international education. These areas were: Teacher Knowledge; Language; K through 12 and University Connections, and Partnerships and Exchanges. Ms. Ravenel further advised that an advisory board of North Carolina business and policy leaders led by former Senator Howard Lee, Executive Director of the State Board of Education, reviewed all recommendations made by the coalition. In closing, Ms. Ravenel provided members with a handout (Attachment 1) identifying the Center's legislative initiatives. She thanked the committee and encouraged their input.

Ms. Ravenel next introduced Clark Plexico, a former North Carolina Senator, who was currently serving as senior policy advisor with the Center for International Understanding. Senator Plexico discussed trends in the international economy and how these trends would impact North Carolina's future economic development and growth. Senator Plexico challenged the committee to be aggressive in its approach to international education and urged support for the Center's global education initiatives. The Chair thanked Senator Plexico and Ms. Ravenel for their presentations.

The Chair recognized Charlotte Hughes, Special Assistant to Associate Superintendent for Curriculum and School Reform Services, NC Department of Public Instruction. Ms. Hughes used a power point presentation to inform committee members about school dropouts in North Carolina and she provided members with a handout of the power point presentation (Attachment 2).

Lou Fabrizio, Director, Accountability Services, NC Department of Public Instruction was recognized by Ms. Hughes to report on North Carolina's high school completion rates and how graduation rates are calculated. Mr. Fabrizio advised about a recent study on dropouts performed by Johns Hopkins University, which tracked graduates and referred to a school's "promoting power." Mr. Fabrizio stated, however, that the figures from the Johns Hopkins study only added to the confusion of the dropout statistics because the study compared the number of students in the senior year to the number of freshmen three years earlier, not taking into account the number of student transfers. Mr. Fabrizio further explained that although not all states had the infrastructure in place to report over a four-year period, North Carolina did have the mechanisms in place to monitor a four-year period and, at the conclusion of the 2005-06 school year, the State would have the ability to report a more accurate graduation rate of the high schools throughout North Carolina (Attachment 3).

Mr. Fabrizio turned the presentation back to Ms. Hughes and, in closing, she identified strategies for improving both dropout and graduation rates. Representative Pate asked what was being done to comply with compulsory attendance laws and their enforcement. Gladys Logan, DPI, advised that dropout prevention counselors and social workers needed more support from the court systems in handling truancy cases. Senator Malone suggested that sensitivity training be added to the list of priorities identified by the Department. Rep. Preston asked if the Department kept a record on the number of dropouts who returned to school. Ms. Hughes advised that currently that information was not being tracked, but that it would be helpful to note.

The Chair next called on Dr. Kathy Sullivan, Director, Human Resource Management/Quality Professionals, North Carolina Department of Public Instruction to present a more detailed account of the teacher shortage which has occurred as a result of the demand created by a growing student population, increased teacher retirements and lower class sizes. Dr. Sullivan provided a report entitled, *"Data Related to the Teacher Shortage in North Carolina"* (Attachment 4).

Dr. Sullivan advised that each year, for the past several years, North Carolina has hired approximately 10,000 new teachers, with about one-third of the teachers coming from North Carolina teacher education programs and the remaining two-thirds coming from other states and from lateral entry. She explained that lateral entry allows individuals that have obtained bachelor degrees from regionally accredited institutions to begin teaching while they continue to work on their teacher license. Dr. Sullivan advised that data collected for the past several years indicated that teachers were leaving the profession for retirement. These numbers were expected to increase because the number of teachers in the state were 50+ years of age and that one in five teachers had 25 years of experience.

She advised that although school systems throughout the state have stepped up their efforts to hire new teachers, they were not only competing with each other for a limited supply, they were also competing with other professions offering higher salaries and more attractive career options. She further informed members that in an effort to attract highly qualified teachers, personnel administrators were increasingly and aggressively recruiting from out of state, offering signing bonuses, on-the-spot contracts, and local supplements.

Dr. Sullivan further advised that the supply of teachers did not meet the demand. The Teacher Turnover Report, which was performed annually by school systems, indicated that teachers were most needed in the areas of math, science and exceptional children, and all were needed at the elementary school level. Dr. Sullivan stated that for the 2002-03 school year about one in ten school systems reported difficulty in finding licensed elementary education teachers, and for the 2003-04 school year, about one in seven systems reported difficulty finding elementary teachers. She further reported that data indicated that the greatest number of lateral entry were employed in the areas of exceptional children, followed by elementary education, high school science, middle grades language arts, math and middle grades science. Dr. Sullivan advised that school systems had been reporting vacant positions for the past six years. At the end of this school year there were 935 vacancies, with 22% at the elementary and birth through kindergarten preschool programs; 13% were at the middle school level; 11% were at the high school level and 30% were exceptional students in the K-12 special subject areas.

Dr. Sullivan informed the committee that the systems most needing teachers were the large, urban and rural, and low-wealth systems. Also, personnel administrators indicated that it was not only a problem of getting teachers to the needed systems, it was a matter of retaining them. In closing, Dr. Sullivan advised that the State Board of Education had appointed a task force that would address issues of retention and recruitment and their report was due to the State Board and the Joint Legislative Committee on Education Oversight in February, 2005. Representative Tolson asked Dr. Sullivan about the status of a reciprocity agreement with other states. She responded that the Select Committee on Reciprocity had submitted a report to the State Board, which required some statutory change before it could be implemented. The General Assembly granted the statutory change this past summer and the report currently remained with the State Board.

Representative Jeffus asked Dr. Sullivan to comment on the school age population either decreasing or increasing, as a decrease would impact the need for additional teachers. Dr. Sullivan responded that she was not aware of any study showing a decrease in school age children and that studies indicate North Carolina continues to be a growth state. The Chair asked Adam Levinson, Fiscal Analyst with the Fiscal Research Division, for his comments about this matter. Mr. Levinson commented that while North Carolina would still be exhibiting signs of growth over the next several years, the large percentage increases that have been experienced over the last five to ten years may begin to decrease and growth would begin to slow over the next several years. At the conclusion of the questions, the Chair thanked Dr. Sullivan for her presentation.

Dr. Richard Thompson, Vice President for University-School Programs, The University of North Carolina, was recognized to present the "Report From the UNC Board of Governors' Task Force Meeting Teacher Supply and Demand" (Attachment 5). Dr. Thompson directed members to the eight recommendations and 34 strategies, listed on Pages 11 through 14. He also pointed out Table 7 on Page 29, which illustrated the student and teacher demographics for select counties in the state. Dr. Thompson also called attention to data in the report that revealed a high percentage of teachers chose to teach in the same city where the university they attended was located. Dr. Thompson also advised that while there was information on general college scholarships available, there was nothing compiled in North Carolina that focused on scholarships for teacher education. A listing has since been compiled and will be updated annually. This listing is shown as Appendix H-1 of the Task Force Report.

Dr. Thompson informed members that the most significant recommendation of the Report was Recommendation 3 (Page 12), requiring that the President of the University of North Carolina develop a plan to grow enrollment in teacher education programs in this state. As a result of the report, Dr. Thompson advised that President Broad, University Chancellors, provosts and the deans of the School of Education had met and established enrollment targets for the next five years and had established system-wide targets for the next 10 years. Dr. Thompson provided a handout (Attachment 6) entitled, "Enrollment Targets for UNC Teacher Education" and reviewed the handout with the committee. After responding to several questions, the Chair thanked Dr. Thompson for his presentation.

Rep. Insko was recognized and asked if the Committee would address how the General Assembly will deal with the Leandro decision. She further commented that although it had been discussed many times, a plan or program had not been developed with the State Board of Education, and she requested this topic be placed on a future agenda for the Education Oversight Committee to study.

The Chair recognized Adam Levinson, Fiscal Analyst with the Fiscal Research Division, who advised on the current system of funding classroom teachers in North Carolina and addressed several questions on this issue. He provided a handout of the power point presentation (Attachment 7) and explained funding under both the basic and supplemental allotments. He further explained how teachers are paid based on the state teacher salary schedule.

Mr. Levinson reviewed for consideration local incentives as possible recruitment and retention tools. He further noted that the General Assembly would be considering the Disadvantaged Student Supplemental Funds (DSSF), which were not appropriated by the General Assembly, but were authorized by the Governor through Executive Order. He further advised that this funding was directed to the 16 LEAs, identified as having the least capacity to serve their disadvantaged students, and that the funds must be used to address the needs of the disadvantaged students, in conjunction with a plan that is coordinated and approved by the Department of Public Instruction (DPI). Following his

presentation, Rep. Pate asked Mr. Levinson for further explanation of tracking the basic allotment funds to an LEA.

Mr. Levinson next reported on the availability of funding to support students at-risk of school failure (Attachment 8). Mr. Levinson reviewed the State Board of Education's definition of what constituted an "at-risk" student and gave examples of circumstances, which would place students at risk. Because his examples of "at risk" students encompassed a broader and diverse group, it demonstrated that because it was difficult to identify a target group, it was almost impossible to identify with precision the cost to serve and fund for "at risk" students. He further reviewed both basic funding and supplemental funding that was currently appropriated and he urged members who wanted more detailed information into the mechanics of how these monies were allotted to either contact the Fiscal Research Division or the DPI website. Mr. Levinson also reported on the federal and local funds available to students who are at risk and he advised on the roles of the state and the flexibility LEAs have in translating the funds into services. He also provided information on the technical assistance and training provided to LEAs by the Department of Public Instruction.

Mr. Levinson concluded his report and responded that he was available for questions. Rep. Yongue asked Mr. Levinson to report on the formula used for distribution of funds to disadvantaged students and report back to the committee. Senator Dannelly asked Mr. Levinson to provide a breakdown showing age, race, and gender of students at risk.

Senator Swindell recessed the meeting for lunch at 11:45 a.m. to reconvene at 1:00 p.m.

Senator Swindell reconvened the meeting and recognized Dr. Ben Matthews, Director of School Support, NC Department of Public Instruction. Dr. Matthews stated that as required by G.S. 115C-521, local boards of education were required to submit their long-range plans for meeting school facility needs to the State Board by January 1, 1988 and every five years thereafter. In 1995, the General Assembly authorized the School Capital Construction Study Commission and charged the Commission to conduct a comprehensive study of public school facility needs in North Carolina. Needs documented in that study helped to justify the $1.8 billion state bond issue that was passed in 1996 and it also changed the five-year cycle of the study. Dr. Matthews provided a report entitled, *North Carolina Public Schools Facility Needs Survey*, (Attachment 9) and reviewed data from the survey conducted in 2000-01 justifying the $6.2 billion identified need for the current five-year period. He advised that the next survey was scheduled to be conducted in the fall/winter of 2006. At the request of Rep. Yongue, Dr. Matthews reviewed the procedures and guidelines followed by LEAs in compiling the data for their facility needs survey. Rep. Yongue also asked Dr. Matthews to comment on the preventative maintenance measures in place to address the renovations needs. Dr. Matthews commented that the preventative maintenance programs varied across the state. Sen. Swindell thanked Dr. Matthews at the conclusion of his report.

Sen. Swindell next recognized Leanne Winner, Director of Governmental Relations, NC School Boards Association. Ms. Winner advised that when the 1996 school bond was

passed, the study commission in place at the time recommended the passage of the bond and also considered that a permanent revenue stream for school construction needs be established to avoid future shortages. Ms. Winner advised that current needs are great and a major infusion, similar to the 1996 bond issue, was needed, as well as the need to establish a permanent revenue source. She urged support for a state lottery to address school construction and school technology needs. These funds could be used as leverage for significant bonding and as a permanent revenue source to address construction needs.

Sen. Swindell recognized Jim Blackburn, General Counsel, NC Association of Country Commissioners, who advised that the Association's Board of Directors' had adopted a legislative agenda at its December meeting of three major priority goals – one of which was legislative authorization for a school construction bond issue. A copy of Mr. Blackburn's remarks is included (Attachment 10).

Sen. Swindell recognized Senator Steve Metcalf to introduce Donna Blevins, founder and developer of Be Smart Kids Learning System. Sen. Swindell advised the 2004 study bill authorized the JLEOC to study ways to use innovative computer-based software to improve math and literacy skills in young children between 18 months and 6 years of age. Ms. Blevins presented a power point presentation and provided a handout for members. (Attachment 11). At the conclusion of her presentation, Sen. Swindell thanked Sen. Metcalf and Ms. Blevins.

Sen. Swindell recognized Pattie Amundsen, School Counselor, Old Richmond Elementary School, Winston-Salem/Forsyth County School System. Ms. Amundsen provided a handout (Attachment 12) comparing the National Board of Certified Counselors (NBCC) credentials and the National Board for Professional Teaching Standards (NBPTS) credentials. She advised that currently North Carolina pays a 12% salary supplement to teachers and school counselors who have obtained national certification through the National Board of Professional Teaching Standards (NBPTS), but school counselors who receive national certification through the National Board of Certified Counselors (NBCC) currently are not eligible for the 12% supplement. To correct the inequity, Ms. Amundsen asked the Committee to support an adjustment in the current pay scale that would include school counselors certified through the National Board of Certified Counselors. Ms. Amundsen responded to several general questions from the Committee.

Chairman Swindell called on Karen Garr, Manager of the Southeast Region, of the National Board for Professional Teaching Standards (NBPTS). Ms. Garr thanked the Committee for their support over the years of both the NBPTS and the national board certification that it offered. She provided a handout (Attachment 13) and reported that currently there were more than 8,000 board certified teachers (figure includes counselors and librarians) in North Carolina and the Board currently was ranked No. 1 nationally. Ms. Garr advised about the process for achieving certification by the NBPTS and she reviewed the procedures and requirements for certification. She also pointed out the major differences between certification by the National Board for Professional Teaching Standards and the National Board of Certified Counselors (NBCC) and stated that

because of these differences, it would create dissention and drive a wedge among faculty members if the NBCC were awarded the salary supplement. However, Ms. Garr stated she would support an alternative way to reward those teachers who had gotten the NBCC counselor certificates. Sen. Swindell thanked Ms. Garr at the conclusion of her report.

Chairman Swindell recognized Eddie Davis, President of the North Carolina Association of Educators (NCAE) to comment on the school counselor certification issue. Mr. Davis reported that the NCAE's legislative agenda supported the concept of rewarding a 12% salary supplement to those who have been certified by the National Board for Professional Teaching Standards, including librarians and school counselors. He also stated that it was time to discuss the issue of placing school counselors on a higher level of the salary schedule, much like the school therapists and speech pathologists, but currently their legislative agenda did not support the concept of awarding the 12% salary supplement to anyone who has not completed the NBPTS process. Sen. Swindell thanked President Davis at the conclusion of his remarks.

Chairman Swindell recognized Co-Chairman Yongue who made some scheduling announcements with regard the last committee meeting scheduled for January 11 and 12. Chairman Yongue urged committee members prioritize issues for future study or consideration as proposed legislation in the upcoming session and to let staff know. He thanked members for their dedication and attendance to all the meetings.

Before adjourning, Chairman Swindell offered members a publication, which was prepared by the NC Center for Public Policy Research, addressing the teacher shortage in North Carolina. Chairman Swindell thanked all the members for their attendance to the meetings and adjourned the meeting at 3:30 p.m.

Senator A. B. Swindell, IV

Mo Hudson, Committee Assistant

Thomas L. Friedman
Talking World Affairs
Nov. 7, 2005

Teaching Globalization

Elizabeth Drahman, Bangkok, Thailand: I teach at the International School Bangkok. I have been tasked with developing curriculum for middle school students to help them become internationally-minded. Could you tell me what you think 8th graders should know about globalization? What do you think they can learn at this point in their development that will help them as international students living out here in the global village. Thank you for your suggestions and for all your work that we have benefited from as international teachers.

Tom Friedman: That's an important question and it is one I get asked a lot and have puzzled over a lot. Part of the answer I am sure is obvious to you already: You want your students to know geography, to know about different cultures, and to learn at least one foreign language, because language is always the gateway into another culture. And you certainly want them to know at least some basic economics to understand the flow of international capital. But I am big believer that what you want to equip them with most is the ability to learn how to learn. There is no more important survival skill in the flat world than the ability to learn how to learn, because jobs and events are changing so fast. So I would say the most important thing you can teach them about globalization is how to teach themselves about the world. When the world is flat, CQ (curiosity quotient) is so much more valuable than IQ (intelligence quotient), because the curious student now has so many more tools at his or her disposal, to reach as far and as wide as their curiosity will take them.

As regards the tools, it is very important for them know how to use something like Google, in a judicious way, so they learn to filter out all the garbage and get to the meat of what they want to learn. That means learning how to use an Atlas properly. That means learning how to use voice over the Internet technologies, like Skype, so that they can make phone calls over the Internet for free anywhere in the world and collaborate with young people in many different countries. I would also assign them for one month to read the daily online edition of any newspaper in another country. Imagine if you had a class of 30 kids and one is reading the Jerusalem Post online, another the Beirut Daily Star, another The Straits Times, another the China Daily, another a Mexico City daily, and another the Times of London, and each one has to report something new every day about their part of the world. It would be a good way to interest them in taking advantage of the flat world to read about the news from other countries — directly from those countries. So those are just a few ideas you might use. But don't forget the substance. The tools are worthless if the fundamentals are not there — the fundamentals of learning a foreign language, of having read the great works of history and literature and ethics produced by different cultures around the world. Google will make your students smarter, but it won't make your students smart. That you have to do the old-fashioned way, by uploading, not just downloading, the great works of history and literature that give young people the context and foundation to appreciate other cultures and what they have contributed to world civilization.

Good luck. What you are doing is really important.

World View

An International Program for Educators
The University of North Carolina at Chapel Hill

World View, an International Program for Educators at the University of North Carolina at Chapel Hill, was established in 1998 to help K-12 and community college educators anticipate and respond to the challenges of an increasingly interconnected world. It collaborates with other international programs at Duke University, NC State, University UNC-Chapel Hill, private universities, NGOs, and global businesses to sponsor professional development programs and provide valuable tools and resources to K-12 schools and community colleges.

Mission

Help schools and colleges prepare students to succeed in an interconnected world in which the rules have changed for everyone.

Accomplish mission by helping educators:

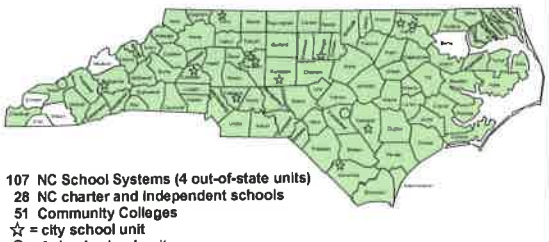
- **Integrate a global perspective into every subject area of the curriculum and at every grade level.**
- **Respond to rapid ethnic and cultural change from immigrant students and improve ESL programs.**
- **Promote foreign language training and international travel.**

Programs and Services for Educators

- Annual Fall K-12 Symposium
- Annual Fall Community College Symposium
- Annual Spring Seminar on *Hispanics/Latinos in the Carolinas*
- Annual Spring Seminar on a specific region of the world
- Annual Study Abroad Visit (paid by participants)
- Annual Community College Workshop
- Week-long Residential Leadership Program in Global Education
- Global Education Partners' Workshop (annual summer program at a school site)
- Monthly electronic *Global Update* highlighting lesson plans, resources, book reviews, etc.
- Semi-annual newsletter, *ThinkGlobal*
- Bi-monthly Community College electronic update
- Website with World View program information, online registration, and global links
- School visits and workshops
- International programs are connected to schools and colleges

Participants in World View Programs (1998-2005)

Educators from 95 counties have attended programs.



107 NC School Systems (4 out-of-state units)
28 NC charter and independent schools
51 Community Colleges
☆ = city school unit
○ = federal school unit

Program Participation. Over 6,500 educators from 107 school systems and 51 community colleges have attended programs during the last seven years.

World View Partnerships. World View provides focused services and information to 34 school system and community college partners. Partners, in turn, provide a commitment to global education, involvement in all World View programs, and support to their educators.

11/05

Major International Programs and Resources University Based

World View
Robert Phay, Director
CB # 8011, UNC at Chapel Hill
Chapel Hill, NC 27599-8011
Phone: 919-962-9264 Fax: 919-962-6794
Email: worldview@unc.edu

Ackland Art Museum
Carolyn Wood, Asst. Dir. of Education or Jerry Bolas, Director
CB # 3400, UNC at Chapel Hill
Chapel Hill, NC 27599-3400
Phone: 919-966-5736 Fax: 919-966-1400
Email: ackland@email.unc.edu

African and Afro-American Studies Department
Julius Nyang'oro, Chair
CB # 3395, UNC at Chapel Hill
Chapel Hill, NC 27599-3395
Phone: 919-966-5496 Fax: 919-962-2694
Email: jen321@email.unc.edu

Alliance for Language Learning
Cathie Hodges, Executive Director
469 Sugarloaf Road Troy, NC 27371
Phone and Fax: 910-572-1101
Email: cthodges@ac.net

Asian/Pacific Studies Institute
Yan Li, Program Coordinator
Duke University
Box 90411, Durham, NC 27708-0411
Phone: 919-684-2604 Fax: 919-681-6247
email: apsi@duke.edu

Carolina Asia Center
Kevin Hewison, Director
CB # 7582, UNC at Chapel Hill
Chapel Hill, NC 27599-7582
Phone: 919-843-0129 Fax: 919-962-8485 Email: cac@unc.edu

Carolina Population Center
Barbara Entwisle, Director
CB # 8120, UNC at Chapel Hill
Chapel Hill, NC 27599-8120
Phone: 919-966-2157 Fax: 919-966-6638 Email: cpcweb@unc.edu

Carolina Speakers
CB # 1793, UNC at Chapel Hill
Chapel Hill, NC 27599-1793
Phone: 919-962-1993 Fax: 919-962-9335 Email: uncspeak@unc.edu

Center for European Studies
Ruth Mitchell-Pitts, Associate Director
CB # 3449, UNC at Chapel Hill
Chapel Hill, NC 27599-3449
Phone: 919-962-6765 Fax: 919-962-5375 Email: rmpitts@email.unc.edu

Center for Global Health – UNC School of Public Health
Margaret E. Bentley, Assoc. Dean
Rosenau Hall, CB# 7445
Chapel Hill, NC 27599-7445
Phone: 919-966-2017

Center for International Business Education and Research
Lynne Gerber, Executive Director
CB # 3440, UNC Kenan-Flagler Business School
Chapel Hill, NC 27599-3440
Phone: 919-962-7843 Fax: 919-962-8202
Email: lynne_gerber@unc.edu

Center for International Understanding
Matt Friederick, Project Manager, NC in the World
412 North Wilmington Street
Raleigh, NC 27601
Phone: 919-733-4902 Fax: 919-733-8578
Email: ciu_info@ciu.northcarolina.edu

Center for Slavic, Eurasian, and East European Studies
Robert Jenkins, Director
CB # 5125, UNC at Chapel Hill
Chapel Hill, NC 27599-5125
Phone: 919-962-0901 Fax: 919-962-2494
Email: slavic@email.unc.edu

Ctr for the Study of Middle & Muslim Civilizations
Charles Kurzman, Asst. Director
227 Hamilton Hall
Phone: 919-962-1241 Email: Kurzman@unc.edu

Curriculum in International and Area Studies
Adam Versenyi, Director
CB # 3263, UNC at Chapel Hill
Chapel Hill, NC 27599-3263
Phone: 919-962-5442 Fax: 919-962-8485
Email: ascaff@email.unc.edu

Institute of Latin American Studies
Arturo Escobar, Director or Sharon Mújica, Outreach Director
CB # 3205, UNC at Chapel Hill
Chapel Hill, NC 27599-3205
Phone: 919-966-1484 Fax: 919-962-0398
Email: smujica@email.unc.edu

International Student & Scholar Services
Robert Locke, Director
CB # 5240, UNC at Chapel Hill
Chapel Hill, NC 27599-5240
Phone: 919-962-5661 Fax: 919-962-4282
Email: oisss@unc.edu

International Social Studies Project (School of Ed.)
Suzanne Gulledge, Director
CB # 3500, UNC at Chapel Hill
Chapel Hill, NC 27599-3500
Phone: 919-962-7879 Fax: 919-962-1533
Email: issp@unc.edu

Office of International Programs (Business School)
Mabel Miguel, Director or Amanda Laird, Associate Director
CB # 3440, UNC Kenan-Flagler Business School
Chapel Hill, NC 27599-3440
Phone: 919-962-6366 Fax: 919-962-8836
Email: miguel@unc.edu or Amanda_Laird@unc.edu

Program in the Humanities and Human Values
Wayne Pond, Director
CB # 3425, UNC at Chapel Hill
Chapel Hill, NC 27599-3425
Phone: 919-962-1544 Fax: 919-962-4318
Email: human@unc.edu

Study Abroad
Robert Miles, Director or Madge Hubbard, Deputy Director
CB # 3130, UNC at Chapel Hill
Chapel Hill, NC 27599-3130
Phone: 919-962-7002 Fax: 919-962-2262
Email: abroad@unc.edu

Triangle Institute for Security Studies
Carolyn Pumphrey, Program Coordinator
302 Towerview Drive, Duke University
Durham, NC 27708-0316
Phone: 919-613-9280
Email: tiss@duke.edu, pumphrey@duke.edu

Triangle South Asia Consortium
John Richards, Director or John Caldwell, Outreach Manager
201 Carr Building, Duke University
Durham, NC 27708
Phone: 919-668-2146 Fax: 919-681-7670
Email: richards@duke.edu or caldwell@unity.ncsu.edu

University Center for International Studies
Tara Muller, K-12 Outreach Coordinator
CB # 5145, UNC at Chapel Hill
Chapel Hill, NC 27599-5145
Phone: 919-843-6860 Fax: 919-962-5375
Email: Tara_Muller@email.unc.edu

Major North Carolina International Programs and Resources (Non-University)

UNC-Chapel Hill Campus Library System
Lisa Norberg, Coordinator of Instructional Services
CB # 3942, R.B. House Library
Chapel Hill, NC 27599-3942
Phone: 919-843-2310 Email: lnorberg@email.unc.edu

Charlotte World Affairs Country
Paola Navarrete, Programming and Membership
UNC Charlotte, 238 Barnard
9201 University City Blvd
Charlotte, NC 28223-0001
Email: pnavarrete@worldaffairscharlotte.org

El Pueblo, Inc.
Melanie Chernoff, Deputy Director
4 N. Blout St., 2nd Floor
Raleigh, NC 27601
Phone: 919-835-1525
Email:Elpueblo@elpueblo.org

Exploris
Pam Hartley, VP for Programs
201 East Hargett Street
Raleigh, North Carolina 27601
Phone: 919.834.4040

Folkmoot
Jamye Cooper, Director
PO Box 658
Waynesville, NC 28786
Phone: 1-877-365-5872 (toll free)
Email: info@folkmoot.com

International Affairs Council
Todd Culpepper, Executive Director
P.O. Box 28124, 118 South Person Street
Raleigh, NC 27601, Phone: 919.838.9191
Email: tculpepper@iacnc.org. Web site: www.iacnc.org

Office of Hispanic/Latino Affairs
Governor's Office of Community Affairs
Axel Lluch, Director
116 W. Jones Street
Raleigh, NC 27603
Phone: 919-733-5361 Fax: 919-733-2120

Rotary International
Ken Morgan, Rotary International Board
PO Box 16067
Chapel Hill, NC 27516
Email: morgank@juno.com

Visiting International Faculty
Jonathan Charney, Program Development Manager
PO Box 3566 Chapel Hill, NC 27515
Email: Jonathan.charney@vifprogram.com
Website: www. vifprogram.com

United Nations Association – USA
Wake County Chapter
Jim Rousin Email: jlroush@aol.comWest Triangle Chapter
Tuck Green, Email: cgreen17@nc.rr.com

Center for New North Carolinians
Nolo Martinez, Assistant Director
413 S. Edgeworth St.
Greensboro, NC 1061
336-256-1061
nulumartinez@hotmail.com

World View

AN INTERNATIONAL PROGRAM FOR EDUCATORS

The University of North Carolina at Chapel Hill

World View Offers Schools and Colleges:

I. Professional Development

1. Global Education Leaders' Program

- One-week immersion for school leaders offered each summer
- Examines global and geographic issues
- CEU credit offered
- Provides demonstrations and techniques for effective integration of global issues into classrooms, schools, and curricula
- Co-sponsored by UNC-Chapel Hill international resource centers

2. Symposiums

- Fall 2005 will introduce both a K-12 and a community college symposium
- Focuses on a major, timely global issue
- CEU credit offered
- Presentations, Socratic seminars and action plan preparation provide a comprehensive learning experience

3. Seminars

- Two offered, back-to-back every spring
- Annual seminar on Hispanics/Latinos in the Carolinas
- Second seminar focuses on geographical area
- CEU credit offered
- Co-sponsored by UNC-Chapel Hill international resource centers

4. International Study Visit

- Two-week trip each June
- Includes school visits, meetings with key educators, home stays, and visits to historic and cultural sites

5. Special Student Programs

- Program on UNC campus for school or college students
- Socratic seminar with UNC faculty

(over)

Campus Box 8011
Chapel Hill, NC 27599

Telephone 919-962-9264
FAX 919-962-6794

E-mail worldview@unc.edu
www.unc.edu/world

II. Outreach to Schools and Colleges

1. **UNC international faculty liaison for schools and colleges.** Schools or colleges that send a team to the symposium or to a seminar will have a faculty member assigned to work with team members while on campus and to be an ongoing contact.

2. **Curriculum Support and Development.** World View curriculum specialist will come to your school or college to speak, lead seminars, or work with a leadership team on internationalizing your school's curriculum.

3. **"Sister-School" connections.** World View will help a school or college establish a partnership with a school in another country. World View will also arrange for Rotary Scholars living abroad to connect to classrooms and schools.

4. **Resource center for speakers.** World View will help arrange for an expert on international issues to come to your school or college to work with students, faculty, and administrators.

5. **Newsletter.** World View publishes a semi-annual newsletter, *ThinkGlobal*, which updates educators on news, events, books, and websites in the field of international studies.

6. **Website.** The World View website provides educators with a resource for reference materials and links to internet sites on global subjects, international organizations, and grant and travel opportunities. The website also provides information on past and future World View programs and access to online registration.

7. **Promotion of Other International Programs.** At each symposium and seminar, representatives from other international programs are invited to display materials and to talk with K-12 and college educators.

8. **Global Updates and College Updates.** Electronic newsletters sent out with information about books, activities, and global opportunities.

9. **Global Education Sourcebook.** World View has compiled a guide of global education materials and websites for educators.

10. **Rotary International Scholars Connection.** World View will connect you with a Rotary scholar from North Carolina who is currently studying abroad.

III. Grant Application Support

Funding global programs. Many action plans to develop or increase global content and activities are started at a World View symposium, seminar, residential program, or international study visit. World View can help locate external funding services and provide supporting statements when schools or colleges apply for funds.

COMMUNITY COLLEGES: PROGRAMS AND SUPPORT

World View began in 1998 as a program to support both North Carolina's K-12 schools and community colleges. For the first six years all its programs were joint for educators K-14. By the sixth year, however, we had the resources to offer separate programs, recognizing the different needs of K-12 and college educators. We also were running programs at capacity, so it was time to split the two groups. Accordingly in 2005 the fall symposium was offered once for K-12 and a second time for college educators and a new spring seminar will be offered just for community college educators. Listed below are the programs in 2005 for college faculty and administrators.

I. Professional Development Programs

- **Fall Symposium** on significant global issues. In 2005 K-12 and college educators will be split for the first time, with a separate community college symposium.

- **Spring Seminars.** Two seminars are offered each spring with separate sessions for community college educators at both seminars.
  - **Hispanics/Latinos in the Carolinas**
  - **Selected World Region**

- **Librarians' Workshop on Globalization (April 2005)**. Jointly sponsored by UNC Library System.

- **Community College Seminar**. This new seminar series starts with a South Asia Seminar in 2006, cosponsored with the Center for South Asian Studies at Duke, NC Central, NC State, and UNC.

- **Global Education Leaders' Program.** A week-long, intensive study of global issues that will impact students, schools, and communities.

- **Study Abroad Visit**. Two-week study visit with homestays and school visits.

(over)

II. Outreach Support

World View's basic mission is to connect schools and colleges to the international programs at Duke, NC State, and UNC. Resources and services specifically tailored to community colleges include:

- **Speaker Series on Global Topics.**
  - Speaker series on international issues are now established at **Lenoir Community College** and **Wayne Community College**
  - Speaker series on the cultural backgrounds of global terrorism for colleges that train terrorism emergency responders. It was offered in 2004-05 at **Central Piedmont, Guilford Tech, Sampson**, and **Wake Tech** community colleges.

- **Support for Efforts to Become More Global.** World View faculty will come to your college to speak or work with a leadership team on making the college more global. The UNC Center for Teaching and Learning will help faculty add global components to college courses. World View also consults with faculty who want to "internationalize" their courses.

- **International Film Festivals.** World View helps colleges establish film festivals by connecting them to the film libraries at the Centers for Asia, Eastern Europe and Eurasia, Europe, and Latin America.

- **Sister Schools**. World View helps locate and establish sister school arrangements with schools across the globe.

- **Travel Abroad for Students and Faculty**. In addition to World View's annual Study Abroad Visit, World View helps colleges develop their own study abroad trips.

- **World View College Updates**. Since 2001 World View has sent electronic updates on global issues to a combined listserv of K-12 and community college educators. In 2005 World View began a new update specifically for college educators.

- **Action Plans on Global Projects**. Each college that sends a team to the symposium or to a seminar will have a faculty member assigned to work with it to develop action plans and to make them successful.

- **Newsletter**. World View publishes a semi-annual newsletter, which helps to keep educators up-to-date on news, events, books, and websites in the filed of international studies.

- **Web Site**. Provides educators with a resource for reference materials and links to internet sites on global subjects and international organizations.

III. COLLABORATION WITH NORTH CAROLINA COMMUNITY COLLEGE SYSTEM

- World View's Associate Director, Neil Bolick, is Ex-Officio member of NCCCS Global Education Board and regularly consults with system administrators and presents at system conferences.

WORLD VIEW PROGRAMS TO SUPPORT LATINO STUDENTS

I. **Annual Hispanic/Latino Seminar**

Recognizing the 700% increase of Hispanic/Latino students in NC during the 90s, World View started a program in 1999 to help educators be successful with this new student population. This annual program:

- Helps educators better understand the culture, history, and politics of Latin America and the cultural traditions of Latino students.
- Showcases successful programs that help Latino students succeed in school.
- Explores topics and educational areas important to Latino students.
- Provides public speaking opportunities for Latino students.
- Promotes networking among educators and experts within and between schools.
- Encourages collaborations and sharing of ideas and innovative strategies.

II. **Latin American Studies Center**

World View connects K-12 schools and community colleges with the Consortium in Latin American & Caribbean Studies. This Duke–UNC center provides outreach support to schools and colleges ranging from resource materials to speakers.

III. **Study Visits to Latin America**

Each June World View and UNC's international studies centers sponsor a study visit for educators who have never traveled abroad. Each visit listed below includes homestays with Hispanic/Latino families and many visits to schools and historical sites. Three study visits have been to Mexico or Central America and the 2005 trip is to Spain.

- 2001 – Guatemala and Belize
- 2002 – Mexico
- 2003 – Mexico (included language instruction)
- 2005 – Spain

IV. **Community College System's Hispanic/Latino Initiative**

World View has worked closely with the Community College Hispanic Initiative, attending board meetings and college forums.

VI. **Outreach Support**

- Monthly electronic newsletter, *Global Updates,* which includes resources on Latino issues. An example is the August 2004 issue "Resources for Helping Latino Students Succeed in School."
- Connects K-12 schools with a Rotary Scholar working in Latin America.
- Includes Latin America sessions in annual Global Education Leaders' Program.
- Provides ESL resources on World View website.
- Encourages schools to include Latino issues in school action plans.
- Connects N.C. schools with schools in Spanish-speaking countries.
- Works with state and local Latino non-profits and advocacy groups.
- Distributes N.C. demographic information by county.

E-mail: worldview@unc.edu
World View
CB #8011
UNC-Chapel Hill
Chapel Hill, NC 27599-8011
tel: (919)962-9264 fax: (919)962-6794

02223 :

Join World View on an exciting 12-day trip to China!
June 19-30, 2006

World View will lead educators on a twelve-day tour of China. Our itinerary includes meetings with education officials, visits to schools, community colleges, cultural centers, historic sites, and museums in Beijing, Xi'an, and Shanghai.

Great Wall (on Itinerary)

The cost of the trip will be $3050, which will include:
Round-trip airfare from Charlotte or Raleigh Durham Airport
Internal flights in China
Transportation by private, air-conditioned bus for all transfers and touring
All meals
Tour services, entrance, and guide fees
Accommodations in 4-Star tourist-class hotels (double occupancy)
Background materials on China

For more information and to receive an application for the study visit, please complete the form below and send it to World View (address below). Please call or email Neil Bolick at 919-843-5332 or nebolick@unc.edu with any questions.

NAME _____ POSITION _____

SCHOOL OR COLLEGE _____

SCHOOL SYSTEM (WHERE APPLICABLE) _____

SCHOOL OR COLLEGE ADDRESS _____

PHONE (WORK) _____ (HOME) _____ (CELL/OTHER) _____

EMAIL _____

***Participants of the World View Study Visit to China must attend the World View Seminar on China on March 22-23, 2006 in Chapel Hill. Registration fee is $135, or less if part of a team.

World View, UNC-Chapel Hill, CB 8011, Chapel Hill, NC 27599-8011 FAX: (919) 962-6794

World View

An International Program for Educators

Global Education Leaders' Program

June 25-30, 2006

UNC Center for School Leadership
UNC-Chapel Hill

Registration fee: $250
Single room fee: $350 or Double room fee: $175

Co-sponsors of 2006 program:
Asian/Pacific Studies Institute
Carolina Asia Center
Center for European Studies
Center for Slavic, Eurasian, and East European Studies
Center for International Business, Education, and Research
Choices Program, Brown University
Consortium in Latin American Studies
Center for South Asia Studies
Triangle Institute for Security Studies
University Center for International Studies

For more information please contact:
Robert Phay, Director
World View
(919).843.9408 or phay@unc.edu

Each June 40 educational leaders from across the state come to UNC for a week-long, intensive study of global issues that will impact students, schools, and communities. The program's objective is to help key educators plan and implement programs that will increase global awareness and respond to global challenges.

Topics and presentations include:

Globalization
- The Cultural Dimensions of Globalization
- Globalization: An Economic Perspective
- Communications Revolution

Geopolitics in an Age of Global Terrorism
- Clash of Civilizations: The Huntington Thesis
- International Terrorism: Background and Future
- The Challenge of a Global World and the Need to Understand It

United States' Place in the World
- U.S. and Latin America
- U.S. and Africa
- Israel and Palestine
- U.S. and the European Union
- U.S. and East Asia
- U.S. and Southeast Asia

Population Dynamics, Immigration, and the Environment
- Critical Global Environmental Issues
- Population Dynamics and Public Health Issues
- Immigration and Demographic Issues in the South

Developing an Action Plan for your School or College
- Individual Sessions with faculty to Help Develop an Action Plan
- Group Discussion to Share Ideas
- Global Education Resource Panel

World View & the UNC University Library

Workshop for Community College Librarians
April 14 - 15, 2005
Chapel Hill, North Carolina

Day 1: Thursday, April 14

TIME	EVENT OR ACTIVITY	PLACE
12:00pm - 1:00pm	Registration	Wilson Library Lobby
1:00pm - 1:30pm	Welcoming Remarks by Robert Phay, Director of World View and Diane Strauss, Associate University Librarian for Public Services and Introduction of Instructors and Participants	Wilson Library Pleasants Room
1:30pm - 2:30pm	Library Instruction and Outreach to Support a Global Curriculum Lisa Norberg, Coordinator of Instructional Services for UNC	Wilson Library Pleasants Room
2:30pm - 3:00pm	Coffee Break	Wilson Library Lobby
3:00pm - 4:30pm	Developing Collections to Support a Global Curriculum Panel Discussion: ▪ Hsi-chu Bolick East Asian Bibliographer ▪ Winifred Fordham-Metz Media Resources Librarian ▪ Charles Cobine Assistant Electronic Reference Services Librarian ▪ Rebecca Huckaby Assistant to the Latin American Bibliographer ▪ Nadia Zilper Head of the Global and Area Studies Department	Wilson Library Pleasants Room
4:30pm-5:00pm	Tour of the House Undergraduate Library	House Library
Evening	See "Evening Options" on reverse side	

(OVER)

Day 2: Friday, April 15

TIME	EVENT OR ACTIVITY	PLACE
8:30am - 9:00am	Coffee & Refreshments	Davis Library, Room 214
9:00am - 10:00am	Customizing an Online Tutorial on Researching Global Issues and Orienting International/New Immigrant Students Part I (Lisa Norberg, Kim Vassiliadis, Erin Payton, and Jason Setzer)	Davis Library, Room 247
10:00am - 10:15am	Coffee Break	Davis Library, Room 214
10:15am - 11:15am	Customizing an Online Tutorial on Researching Global Issues and Orienting International/New Immigrant Students (Part II) (Lisa Norberg, Kim Vassiliadis, Erin Payton, and Jason Setzer)	Davis Library, Room 247
11:15am-12:00pm	Interlibrary Services (Geneva Holliday)	Davis Library
12:00pm - 1:00pm	Box Lunch	Davis Library, Room 214
1:00pm - 2:30pm	Customizing an Online Tutorial on Researching Global Issues and Orienting International/New Immigrant Students (Part III) (Lisa Norberg, Kim Vassiliadis, Erin Payton, and Jason Setzer)	Davis Library, Room 247
2:30pm - 3:00pm	Final Wrap-Up	Davis Library, Room 247

EVENING OPTIONS for April 14

Dinner in Area Ethnic Restaurant
(see registration packet for list)

5:45 pm - Wilson Library
A Talent to Deceive: Mystery and Detective Fiction in Rare Books - Talk by Edgar Award novelist Margaret Maron.

8:00 pm - Paul Green Theater, UNC-Campus
Caesar and Cleopatra, by George Bernard Shaw, directed by David Hammond. One of Shaw's most affecting comedies, the play is an enduring vision of humankind's unending quest for greatness - and its sometimes surprising rewards.
PlayMakers Repertory Company. Call 919-962-PLAY or visit www.Playmakersrep.org for more information.

A REPORT ON GLOBAL EDUCATION INITIATIVES AND OPPORTUNITIES IN THE
NORTH CAROLINA COMMUNITY COLLEGE SYSTEM

Submitted to the

JOINT LEGISLATIVE EDUCATION OVERSIGHT COMMITTEE
February 8, 2006
9:00 A.M., ROOM 643 Legislative Office Building
Senator A. B. Swindell, presiding

H. Martin Lancaster, President
North Carolina Community College System

Fred Williams, Executive Vice President
North Carolina Community College System

Dr. Delores A. Parker, Vice President
Division of Academic and Student Services

North Carolina Community College System
GLOBAL EDUCATION REPORT SUMMARY
February 8, 2006

The North Carolina Community College System views "Global Education" as an important issue to be addressed. North Carolina is now home to over 300,000 Hispanics, many of whom are enrolling in community colleges. Additionally, the number of Asians and other ethnic groups continues to increase. The State experienced a 73% increase of new immigrants who moved to the state between 1995-1999. This was the largest increase by any state in the nation during this period. According to the 2000 census, the state's total population increased by 14.9% (993, 802). During this period, the Asian and Pacific Islander, and Hispanics populations increased by 96% (51,817) and 127% (98,216), respectively. The state's current Hispanic population was estimated to increase to 500,000 by 2005.

The North Carolina Community College System Office has been instrumental in leading the effort to globalize our colleges. In March 2001, 350 community college presidents, instructional administrators, faculty and staff met in Raleigh to begin formulating global education action plans for their local colleges. In October 2001, a follow-up conference was held at Nash Community College in Rocky Mount to share lessons learned in the implementation of these plans. These conferences were funded by a grant of $50,000 from the W.K. Kellogg Foundation, and a grant of $25,000 from the Stanley Foundation.

Despite budget constraints, lack of staff, and staff turnover, the System Office has been able to offer video-conferences during the period 2002-2005. An Hispanic/Latino Initiative was staffed in August 2003 and has been active in bringing together members of the Hispanic/Latino community and faculty/staff at the community colleges. This initiative, funded by a two-year grant from the Z. Smith Reynolds Foundation, is currently in need of a new funding resource to continue its efforts to meet the educational needs of the growing Hispanic/Latino population in North Carolina.

Additionally, the System Office is an active participant in World View conferences, is a member of the American Council on International Intercultural Education, and has formed a Global Education Consortium.

At the request of the North Carolina General Assembly, we recently sent out a questionnaire to the colleges regarding their global education activities. We asked two questions:

1. What is your college doing to promote Global Education, and
2. What should your college be doing to promote Global Education?

Forty-eight community colleges responded to the request for information. The responses are encouraging in some areas, but telling in other areas of the need for assistance to bring about a coordinated response to the challenges of preparing a workforce to participate and compete in a global economy.

WHAT ARE NC COMMUNITY COLLEGES DOING TO PROMOTE GLOBAL EDUCATION?

- Several colleges have provided learning opportunities for students and faculty in France (Asheville-Buncombe Technical Community College); Peru and Spain (Blue Ridge Community College); Brazil and Italy (Caldwell Community College and Technical Institute); Uruguay, Great Britain and France (Cape Fear Community College); New Zealand, Germany and Brazil (Mayland Community College).
- Forsyth Technical Community College's (FTCC) president was the sole community college representative invited by the Department of Labor to participate in the Brussels European Union Economic Summit. FTCC has hosted delegations from Amur, Voronesh, Ulyanovsk and Komi, Russia as well as Moldova. The college is offering interactive hybrid business courses with Ulyanovsk and offered a 2005 summer link with Robert Ludwig Schule, a technical school in Germany.
- Community colleges are participating in growing numbers in programs offered by World View of the University of North Carolina – Chapel Hill. One hundred fifty-eight faculty, staff and administrators from community colleges participated in the World View **Community College Symposium 2005, Global Science: What Every Faculty Member Needs to Know**. Participants develop action plans that can be fine tuned to meet the needs of their campuses. Plans include action items to incorporate global education in the mission of the institution, to infuse global education in the curriculum, to develop campus committees on global awareness, to form international student clubs, and a myriad of other activities.
- Students are involved through the leadership of the Student Government Associations or stand alone clubs that host international guest speakers, provide international food day activities, develop humanitarian relief efforts, and sponsor international festivals.
- Sister college relationships have been fostered within the community college system. Johnston Community College has formed a relationship with Ranong Community College in Thailand; one faculty member will participate in an exchange with the University of Ulster, Ireland, in spring 2006. Forsyth Technical CC has formed a cooperative agreement with Ulyanovsk State University in the Russian Federation. Wake Technical CC has formed a partnership with the Technical Institute in Bolivia.
- Professional development has taken place through "lunch and learn" activities in which faculty who have traveled abroad share information about those experiences. Mayland Community College faculty host such meetings on a monthly basis and present information on travel to Belgium, France, Germany, China, Russia, Brazil, Mexico and Thailand.
- Guest speakers are invited to campus and play a major role in exposing students to international ideas outside of their communities. Pamlico Community College has invited Pete DeVoss, Foreign Diplomat to present an educational discussion group.
- Courses have been revised to incorporate global education perspectives. Humanities courses are most often used as the vehicles to provide global awareness experiences. Course offerings with cultural perspectives are offered in Command Spanish, World History, Western Civilizations, and Spanish in the Workplace at Piedmont Community College.
- Colleges are hosting receptions for International Students. Pitt Community College sponsored speakers from Afghanistan, Mexico, the United Kingdom and Iran.

WHAT SHOULD YOUR COLLEGE BE DOING TO PROMOTE GLOBAL EDUCATION?

The most often mentioned obstacle to Global Education Initiatives was a lack of funding. Extra activities such as faculty/student study abroad and cultural exchanges must be funded by the individual participant or by limited Foundation or Grant money. In one case, the funds came from the international partners.

The second most mentioned obstacle was a lack of staff to direct and coordinate Global Education Initiatives. The community college staff have so many other constraints on their time that it is difficult to stretch to adequately provide overseas learning opportunities and/or local cultural experiences.

Several colleges noted a lack of support from the local community and/or faculty and staff at the college level. One college asked for more support and information from the System Office.

Despite these obstacles almost all of the responding colleges are using creative ways and limited funding to provide as many global experiences as possible. In order to support global education, colleges indicate that they need:

- Financial support to expand opportunities for travel abroad for students and faculty (Asheville-Buncombe Technical CC, Bladen CC, Caldwell CC & TI, Catawba Valley CC, Halifax CC, Isothermal CC, Pamlico CC, Piedmont CC, Pitt CC, Robeson CC, Vance-Granville CC). This need includes the ability to develop faculty exchange programs and student exchange programs. The benefits of an enlightened campus community extend to the local community that is attempting to attract an international presence of business and industry.
- Professional development for faculty and staff about the importance of global education and the skills to infuse global education into the curriculum (Alamance Community College, Blue Ridge CC, Central Piedmont CC, Isothermal CC, Nash CC, Richmond CC, Robeson CC, Sandhills CC).
- More support to bring in guest lecturers (Bladen CC, Brunswick CC, Caldwell CC & TI, Cape Fear CC).
- More resources to allow partnerships with World View of UNC/CH. Worldview has emerged as a strong partner for North Carolina Community Colleges.
- Support to implement Diversity/Global Awareness plans (Caldwell CC & TI).
- Increased support for international student activities including newsletters, international clubs, and activities to improve intercultural relationships (Catawba Valley CC).
- Resources to provide bi-lingual training in specialized areas such as child care, small business, basic computer technology, legal/court issues, customer service, human resources, CNA, BLET, financial planning, and welding (Central Carolina CC).
- To develop a training program and resource bank to assist faculty, administration, and staff with incorporating a global perspective in their courses/programs/responsibilities (Central Carolina CC).
- Support for the educational needs of students with diverse backgrounds (Coastal Carolina CC)
- A budget for globalization that is consistent with the goals to which the colleges have committed themselves (Craven CC, Durham Technical CC, Gaston College).
- Staffing to support requests for enrollment by international students, positions to work with resources in the community to support international students, and personnel to

coordinate global education initiatives (Durham Technical CC, James Sprunt CC, Randolph CC).

- Grants which will provide funding to support (at least partially) the development of new educational initiatives (Fayetteville CC, Forsyth Technical CC).
- To expand the opportunities to work with NC Dept of Commerce International Trade in pursuing "Doing Business Programs" on location in the countries of Mexico, Canada, Korea, China, Japan, and Germany. These countries have NC trade representatives on location.
- To create an export trading company or export management company in collaboration with Small Business Center Network Directors who want to participate and bring the Export Assistance Centers into the group and to work with the United States and North Carolina Departments of Commerce, Federal Trade Zone Operators, and University programs to expand our education delivery to assist businesses in building international trade opportunities (Wake Technical CC).

The North Carolina Community College System Global Education Committee, while planning the 2001 conference, wrote the following value statement: "to ensure the economic survival and well being of our communities, it is imperative that community colleges develop a globally and multi-culturally competent citizenry." This theme continues to be the foundation, on which all of our global education rests. With additional assistance from the North Carolina General Assembly, the North Carolina Community College System will be strategic in ensuring that the faculty and staff have the necessary competencies needed to embrace the concept of global education as it unfolds before them.

Submitted by:
Dr. Delores A. Parker
parkerd@nccommunitycolleges.edu
919/807-7096

Presentation to Joint Legislative Education Oversight Committee

Global Education Initiatives

Elsie C. Leak, Ed.D.
Associate Superintendent
Curriculum and School Reform Services
North Carolina Department of Public Instruction

February 8, 2006

Foreign Language Instruction in North Carolina Public Schools

Education Oversight Committee
Presentation
NCDPI
February 8, 2006

Languages

	1994-95	2000-01	2004-05
• Spanish	352,105	250,407	255,415
• French	42,163	44,253	38,304
• Latin	12,757	13,366	15,472
• German	6,018	6,025	6,133
• Japanese	1,081	833	2,618
• Chinese	67	49	277
• Russian	72	10	24
• Other		324	531

Elementary Enrollment

	1994-95	2000-01	2004-05
Spanish	246,666	112,294	68,246
French	4,779	8,728	4,384
German	486	298	94
Japanese	499	824	993
Chinese	16	11	101
Exploratory	32,898	15,742	25,580

Middle School Enrollment

	1994-95	2000-01	2004-05
Spanish	26,941	37,933	44,736
French	8,189	8,966	6,322
Latin	753	954	1,379
German	459	662	626
Japanese	86	537	218
Exploratory	18,891	15,490	16,342

HS Spanish

	1994-95	2000-01	2004-05
I	40,031	45,564	63,992
II	27,683	35,253	54,842
III	7,673	10,469	15,912
IV	2,141	3,701	5,251
V	730	1,473	2,337
VI	2	31	61

HS French

	1994-95	2000-01	2004-05
I	13,590	11,512	11,970
II	10,379	9,156	9,669
III	3,543	3,513	3,549
IV	1,238	1,612	1,630
V	367	549	757
VI	1	44	23

Current Critical Language Enrollment

Arabic	Chinese	Russian
None	Chapel-Hill Carrboro Schools *Glenwood Elementary –* Dual Language Program - K-3 #84	
	Charlotte-Mecklenburg Schools *Independence HS* #38 *Olympic HS* #48 *Smith Language Acad.* #39	
	Wake County Public Schools *Enloe HS* # 73 *Ligon MS* # 7 *Wiley Elementary* # 17	#26

Reasons for Elementary Enrollment Decline

- ABC policy and emphasis on testing
- Growing ESL demands
- Program outcomes vs. expectations

Foreign Language Immersion Programs

- Total Immersion
  - The "regular" curriculum is taught in the foreign language for the entire school day
- Partial Immersion
  - Some content is taught in the foreign language during half of the school day
- Dual Language
  - Similar to partial immersion
  - Groups native speakers of English with native speakers of the foreign language (50/50 mix)

Building the K-5 Infrastructure for Dual Language/Immersion Programs

- State level 3-year federal FLAP (Foreign Language Assistance Program) grant
  - Develop K-5 Dual Language/Immersion foreign language curriculum
  - Develop model in-state professional development for teachers in these programs
  - Develop appropriate teacher licensure

Middle School Programs

- Exploratory Programs
  - Vary in length from a few weeks to a semester
  - Non-sequential and introduce students to one language and culture, but do not lead to language proficiency
- Beginning Sequential
  - Vary in scheduling and outcome
- Continuing Sequential
  - For beginning seq. or elementary FLES students
  - May allow students to enter upper level HS course

High School Programs

- Traditional Programs
  - Level I - Level VIII
  - Development of communicative skills and the understanding and appreciation of other cultures
- Advanced Placement
  - Currently available in many languages
- International Baccalaureate
  - Includes Foreign Language Study and Examination
- Spanish for Native Speakers
  - Model for heritage speaker instruction

Issues Affecting Foreign Language Learning

- Constant tension between the belief in the need for unity expressed in a monolingual policy and the values of multilingualism, plurilingualism and diversity
- US educational policy on a state level and lack of concern for foreign language in NCLB
- Belief that English is enough and that students do not need to maintain their home language

Issues continued….

- Disconnect between the time made available for language learning and the realities of the time required to learn language to the levels required in the workplace

Burning Questions

- How do we produce students proficient in a language other than English?
- How do we increase offerings particularly in the less-commonly taught languages?
- How do we promote the maintenance of heritage languages?

GlaxoSmithKline

Joint Legislative Education Oversight Committee

Christine M. Boytos
US Science Education
GlaxoSmithKline

February 8, 2006

I am Christine Boytos. After 22 years as a scientist at GSK, I moved into my current role at GSK, which is to direct US Science Education. Senator Swindell, Representative Yongue and the members of the Joint Legislative Education Oversight Committee, thank you for inviting me to share my perspective on the present and future of K-12 science education in North Carolina.

Many recent reports show that the US is falling behind in science. That means that there aren't enough workers who are skilled enough in science to satisfy the need for science-and technology-based jobs in our country. The deficit of STEM* professionals in the US poses a problem for economic development and national security. As North Carolina moves toward an economy rooted in science and technology, we have the opportunity to satisfy the state's need for a skilled workforce by changing the approach to science education at the K-12 level. North Carolina's focus should shift to inquiry-based science instruction, which is especially critical for the elementary and middle grades.

A strong foundation in K-8 is essential to insure science learning at middle school, high school and beyond. Student achievement in science can fuel the kind of growth that will sustain our state. The NC Biotechnology Center estimates that by 2013, NC will be home to 48,000 biotechnology jobs and will increase to 125,000 jobs by 2023. NSF estimates that if we do not change the rate that we develop our science talent pool, in 10 years 90% of the world's scientists will work in Asia.

In his 2004 Strategic Plan for Biotechnology, Governor Easley recognized the improvement of science education as path toward economic competitiveness for NC.

*STEM = Science, Technology, Engineering, Mathematics

Programs with GSK Resources (Volunteers or In-kind)

GSK Program	# Employees	# Students	# Teachers
Sharing Science (Local schools, TASC)	113	79,500	3335
SPARK! (Student Science visits)	25	250	6
Sally Ride Science Festivals	70	7000	100
Totals	113	79,500	3335

Insert *Hand-clasp activity*

As a science and technology-based company, GlaxoSmithKline recognizes the importance of contributing to the development of this talent pool. We take our place here today to encourage North Carolina to develop a unified state approach to science education that includes inquiry-based science instruction, ongoing professional development of teachers, involvement of families to create high expectations for our children and public awareness of the important role of science in our state. In that spirit, GlaxoSmithKline seeks to support programs that have the potential to fill those goals to create a pipeline of talent in North Carolina.

GlaxoSmithKline has applied resources to programs such as NC-ISE, Destiny Mobile Science Program, the Kenan Institute Teaching Fellows, the Museum of Natural Sciences Educators of Excellence Program, NC-PIMS, Duke's TASC Program and Futures 4 Kids because these programs not only understand the importance of inquiry-based science and science careers but they also implement programs that create sustainable change.

This slide shows programs with employee involvement or in-house facilities support.

External Science Education Programs Supported by GSK

- Educators of Excellence, Museum of Natural Sciences
- Futures 4 Kids
- Kenan Teaching Fellows, KIETS
- Morehead Planetarium/Science Center
- NC Infrastructure for Science Education (NC-ISE)
- NC Science Teachers Association
- Sally Ride Science Festivals
- Summer Technology Institute, Cary Academy
- UNC DESTINY Mobile Lab
- UNC NC-PIMS
- Women and Math

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In addition to GSK-based programs, we support science education programs that have an impact across North Carolina.

You can find one or more of the programs on these two slides at work in schools in each of your districts.

Even though there is no overarching state policy on inquiry-based science education, many programs like these form collaborative networks to create webs of significant progress in moving forward together. These networks will make even stronger connections when there is a cohesive state plan for science education. This growing cohesiveness will strengthen the state's economy by grooming a talented workforce together.

Barriers We Face

- Science education is not understood as a **conduit to student achievement** in non-science skill-based subjects.
- Science education is **undervalued** for its contributions to **equity and closing the achievement gap.**
- There is a **lack of funding** for curriculum materials to begin implementation of **inquiry-based science**.
- It is not widely recognized that, once implemented, the cost of maintaining materials-based science instruction **may be more economical** over time than textbook-centered instruction.
- Science achievement is not **communicated** as a **priority of the state**.

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Where Can You Start?

- **Understand and communicate** the influence of inquiry-based science instruction on student achievement in reading, writing, math and technology and encourage integration of science with other important curricular areas.

- **Recognize and build upon the existing initiatives**, such as NC-ISE, DESTINY, Educators of Excellence and Kenan Teaching Fellows, to boost the head start North Carolina already has toward improving the pool of talent in North Carolina.

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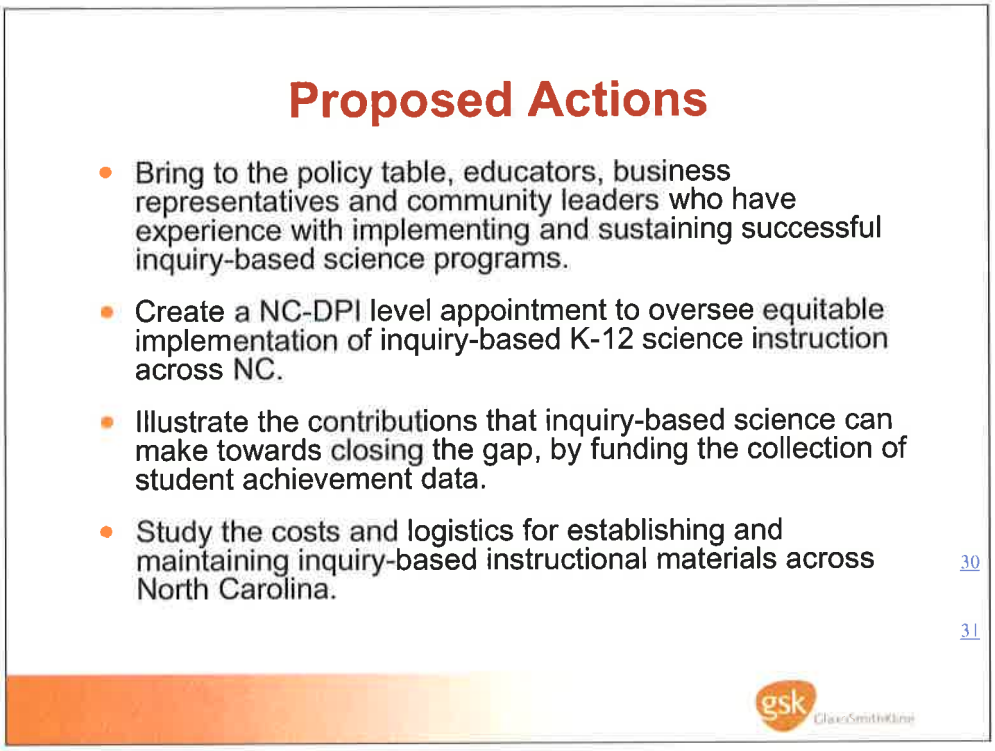

North Carolina is rich in experience and leadership talent in inquiry-based science instruction. This expertise is not being optimally tapped to move North Carolina forward into a science and technology-based economy. If we keep doing the same things with the same people, we will continue to get the same results.

It will be beneficial to have statewide K-12 alignment in inquiry-based science instruction. This alignment can be created and overseen by NC DPI appointment whose sole responsibility is implementing and sustaining inquiry-based science education. Our efforts should be focused on the prize: well-rounded students who will become a strong workforce to fuel North Carolina's competitive edge.

Inquiry-based science instruction can contribute to creating equity. Through science, we can engage minds to achieve higher in non-science areas: math, reading, writing.

To understand the opportunities and challenges in implementing and maintaining inquiry-based instructional materials (kits, online programs, texts), study the costs and logistics. There is evidence that curriculum unit materials (kits) may be more cost effective over time than textbooks and may provide more learning value to our students.

Science Education Programs at GlaxoSmithKline

GSK Scientist Involvment	# GSK employees	# students	# teachers
Sharing Science **(RTP, UM/UP)** GSK scientists share age-appropriate science activities in area schools. Training and materials are provided to our scientists to help them present engaging activities that inspire interest in science, highlight science careers and explain the science and careers involved in taking a new medicine from discovery to market. These interactive activities are aligned with the NC K-12 science standards. ***Sharing Science*** partners with:			
• Local schools: scientists visit local classrooms of their own choosing or by general request. Because we can not serve every RTP classroom, Scientist participation is dependent of availability.	75	2500	75
• Duke University TASC program: 3000 teachers come to GSK's Center for Science Teaching and Learning each year to improve their skills in inquiry-based science instruction in workshops led by Duke University instructors. Teachers receive all instructional materials to teach the science content in their classrooms. Workshop classrooms, instructor's offices and warehousing of instructional materials are provided at GSK.	3	75,000* (*indirectly through teacher development)	3000
• Take Your Child To Work Day: GSK employees' children participate in an on-site program to learn more about GSK. A wide variety of activities are presented to teach them about jobs at GSK, the medicines development process and their parents' roles at GSK.	20	500	---
• Science Fairs/Career Days/Family Science Nights: GSK scientists judge numerous science fairs and competitions, share hands-on science at science days in elementary schools and career days at area high schools. Of particular importance is our participation in family science nights.	10	1500	10
• Other teacher professional development: We participate in inquiry science-driven professional development of science teachers with local and national organizations	5	---	250

Christine M. Boytos, US Science Education, GlaxoSmithKline
February 8, 2006

GSK Scientist Involvment (cont'd)	# GSK employees	# students	# teachers
Student Science Visits • SPARK! **(RTP)** High school biology students visit GSK's Center for Science Teaching and Learning to participate in hands-on bioscience workshops, learn about careers in science and become familiar with the pharmaceutical research process. Activities are led by GSK scientists. • Visiting Students Program **(UM/UP)** High school students visit GSK R&D campuses to do hands-on science, tour the facilities and learn more about the pharmaceutical research process. Activities are led by GSK scientists.	25 25	250 200	6 6
Sally Ride Science Festivals (12 US cities) GSK is a national sponsor of the Sally Ride Science Festivals (SRSF). Middle school girls and their parents visit a science-based street fair, hear a keynote address by Sally Ride (the first US woman in space), and participate in hands-on workshops led by GSK women scientists. At the GSK street fair booth, scientists and sales reps work side-by-side to present a vibrant array of hands-on activities about DNA, genetic diversity, research tools, and the drug development process.	70	7000	100
	scientists	students	teachers
Totals per year	233	86,950	3447

External Programs supported by GlaxoSmithKline
Cool Chemistry and *DNA: Secret of Life* DVD (Morehead Planetarium & Science Center)
DESTINY mobile laboratory (UNC)
Educators of Excellence (NC Museum of Natural Sciences)
Futures 4 Kids
Kenan Teaching Fellows (KIETS)
NC Infrastructure for Science Education
NC-PIMS (UNC)
NC Science Teachers Association- State Science Fair
Sally Ride Science Festivals
Summer Technology Institute (Cary Academy)
TASC/CIBL (Duke University)
Women and Math (NCCU)

Christine M. Boytos, US Science Education, GlaxoSmithKline
February 8, 2006

Presentation to Joint Legislative Education Oversight Committee

Science Education

Elsie C. Leak, Ed.D.
Associate Superintendent
Curriculum and School Reform Services
North Carolina Department of Public Instruction

February 8, 2006

PUBLIC SCHOOLS OF NORTH CAROLINA

Science Education in North Carolina

Elsie C. Leak, Ed.D.

Joint Legislative Education Oversight Committee

2/8/06

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Why Science?

- **United States and North Carolina need more and better science education.**
  - Competitive workforce
  - Informed citizens
- **Science and Technology Education is key to creating our future.**
- **Science is an engaging context for learning other essential skills.**

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Rigorous *Standard Course of Study*

- **Inquiry based with rigorous discipline-specific content.**
- **Aligned to NAEP and national standards.**
- **3 science courses required for high school graduation. (Biology, Earth Environmental Science and a physical science.)**

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SCS is Assessed in Science

- **New tests being developed for fifth and eighth grades.**
- **4 End-of-Course tests**
  - Biology, Chemistry, Physical Science, and Physics.
- **Balanced curriculum survey**
  - assessment beyond student tests.

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DPI Curriculum Support

Support documents

- Include essential concepts, strategies, laboratory investigations, activities, web resources, safety information.
- New documents for honors courses.
- Developed by teachers and scientists from across the state.

Professional development

- District leaders
- Teachers

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Collaboration with Career and Technical Education

- **CTE curricula include many applied sciences.**
  - Biotechnology pathways
  - Scientific Visualization
  - STEM
  - Project Lead the Way

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Enrollment Trends and Issues

- Increasing Enrollment in AP Environmental Science
- Declining participation rates in Chemistry and Physics

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Partners

DPI

- Works with many organizations to improve NC Science Education.
- Collaborates to provide professional development opportunities for teachers.
- Gets curriculum input from IHE and industry scientists.
- Supports variety of external grant applications.
- Provides curriculum input to education outreach efforts for a variety of science organizations.

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Examples of the many organizations supporting Science Education

- **NCSTA – North Carolina Science Teachers Association**
- **UNC System**
  - M.Ed. In Science Education programs
  - Science House (NC State)
  - Destiny Bus
  - Morehead Planetarium
  - Hosts for summer science leadership (UNC-Asheville this summer, ASU in 2003)
  - Learn NC
  - MSEN Professional Development
- **DENR**
  - Office of Environmental Education
  - Museums
  - Sedimentation Education
- **Biotechnology Center**

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Examples (continued)

- **Kenan Fellows**
  - Teacher fellowships
  - Scientist mentors
  - Curriculum products
- **NC School of Science and Math**
  - Residential program
  - Distance learning for students and teachers
  - Summer workshops and programs
- **Burroughs Wellcome Fund and the Science Mathematics Technology Education Center**
  - Facilitate bringing teachers and scientists together
  - Grants for Student Science Enrichment projects
- **NC-ISE**
  - NRC model-components of systemic support for science
  - Emphasis on doing science and systemic change
- **NCSLA**
  - North Carolina Science Leadership Association

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PUBLIC SCHOOLS OF NORTH CAROLINA

Challenges

Time spent on Science K-8

- Survey data indicate that only 16% of elementary teachers teach science daily, 11% don't teach it at all, 16% indicate only occasionally (less than one science lesson a month).
- Unintended consequence of focus on math and reading testing.
- New tests should encourage increased science focus K-8.
- Professional development focusing on integrating science with math and reading should help teachers increase time on science.

PUBLIC SCHOOLS OF NORTH CAROLINA

Issues (continued)

NC needs more skilled science teachers

- Need accessible and affordable professional development.
- SBE recently approved new HOUSSE standards for separate certifications for HS science disciplines (alternative NCLB certification) to facilitate teachers meeting federal standards while focusing on their content needs.
- Federal MSP grants administered by department have helped some district/university partnerships provide exemplary professional development.

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Increased enrollment in Science Education Masters Programs is needed

- Current 300 level certification where newly certified teachers with 4 year degree qualify to teach all sciences is problematic.
- Master's Programs with strong science content component will:
  - Improve the opportunity to learn for students (higher quality teachers).
  - Help retain new teachers in NC (Master's teachers are better paid).
- Teachers (especially new teachers) need reduced tuition (up-front) and modified time schedules to make their participation feasible.

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Models and lessons learned

- Mixture of on-line and face to face professional development allows rural teachers to participate. (ECU has nationally recognized on-line courses.)
- We can learn from the M.Ed. programs set up by the Federal MSP projects
- Need increased cooperation between science/ science Ed in IHEs to provide courses for teachers.

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Issues (continued)

Need to increase enrollment in higher level science courses, especially Physics (Chemistry, Physics, Advanced Placement).

- Students need encouragement to choose rigorous classes.
  - Rigor committee and State Board will consider proposal for STEM recognition with diploma.
  - Department is working on materials for counselors, students, and parents.
- Teachers and administrators need encouragement to place students in more rigorous classes.
  - Staff will ask rigor committee to consider requiring districts to report participation rates when reporting EOC scores.

NC-ISE ... because you can't memorize understanding

North Carolina Infrastructure for Science Education

An Inquiry Endeavor

Brenda S. Evans
Executive Director NC-ISE
NC State University
2245 N. Hills Drive, Suite J
Raleigh, NC 27612
(919) 788-5355 phone
(919) 788-5357 fax
brenda_evans@ncsu.edu
www.nc-ise.org

What's Happening Nationally?

- Science for All Children, National Academy Press, 1997
- National Science Education Standards, National Academy Press, 1996
- Tapping America's Potential: The Education for Innovation Initiative July, 2005
- National Academy of Science Report, October 2005
- Promote America's Competitive Edge (PACE) Act. January, 2006)
- 21st Century Schools

Notes

Many recent studies and surveys show that the US is falling behind in science. This means that there aren't enough workers who are skilled enough in science to satisfy the need in the science and technology based jobs in our country. This poses a problem for economic development and national security. As NC moves toward an economy rooted in science and technology, we are challenged to satisfy the state's need for a skilled workforce by changing the approach to science education at the K-12 level. NC focus should shift to inquiry based science instruction which is especially important in the early grades. A strong foundation in K-8 science, is essential preparation to insure science learning at elementary school, middle school, high school and beyond. Student achievement in science will fuel the kind of growth that will sustain our state.

Recent Recommendations to Strengthen North Carolina K-12 Math and Science Education

- Governor's Strategic plan for growing the state economy through biotechnology
  - **The North Carolina Infrastructure for Science Education Program (page70)**
  - The Gates Foundation grant to create innovative schools (page 70)

Notes

An important step towards changing science education was taken with the development of the governor's strategic plan for biotechnology in 2004.

The NC-ISE program has not yet received any funding under this Biotechnology Initiative.

Most of the National and state programs reports presented here show we need to focus on K-12 science education but current programs are gearing their initiatives toward high school.

The work of NC-ISE is primarily focused on: 1) K-8 students and teachers by providing professional development and leadership development and 2) Starting with the system leadership and assisting them in the development of a 3 to 5 year science plan.

NC is not leading our.students into the talented science and technology work force needed to sustain economic development. The current system continues to produce students poorly prepared for high school science, math and technology and likewise poorly prepared to meet the needs of the US STEM workforce.

President Bowles comments.

Current Inquiry Programs in North Carolina

- NC-ISE - Science, Math, Literacy, Technology
- TASC - Science, Math, Literacy, Technology
- NCSSM - Science Now- Science, Math, Literacy, Technology

Notes

Chris mentioned several inquiry programs that GSK is supporting . One of which is NC-ISE . I would like to point out two programs that are work that work with NC-ISE and are focused on the same elements as NC-ISE.

North Carolina Infrastructure for Science Education An Inquiry Endeavor

- A statewide partnership to encourage and sustain change, promoting student achievement in science, math, literacy and technology
- An inquiry science education program that starts with preparing school system leadership for change
- Promotes inquiry science with strong links to mathematics, literacy and technology

I have been invited here to share more information about the NC Infrastructure for Science Education (NC-ISE) a program that is having a major state-wide impact. This NC-ISE program already encompasses many of the recommendations of the previously stated national and state reports on how to change science education in the US to regain our competitive edge.

Since 1998 the NC-ISE program has focused on facilitating inquiry-based science education in North Carolina. By "inquiry" we mean children doing science to learn science, students engaged in meaningful inquiries that help them understand how new knowledge is gained. This promotes in-depth understanding of science and scientific concepts. It stimulates student achievement in math, literacy and technology, while developing science-literate critical-thinkers and problem-solvers that our state's citizenry, business and industry need.

Outcomes of Inquiry Science Sustained

- Positive Impact on School System
- Improvement of Science Teaching Skills and Potential Increases in Teacher Retention
- Students Who Love Learning Science

Notes

System Impact

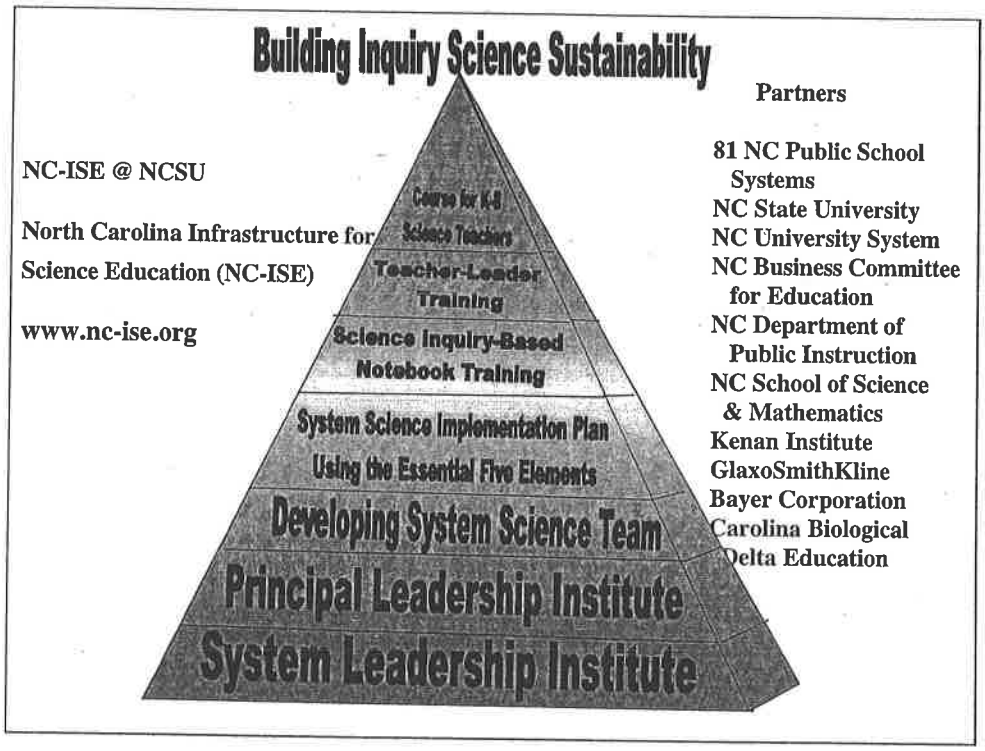
- Cost-effective acquisition of instructional materials
- Continuing development of system teacher leaders
- Cost-effective on-going Professional Development
- Teachers empowered to improve instruction with strong administrative support
- School-Community-Business network supports and promotes student engagement

Teacher Impact

- Enhanced Content Knowledge and Process Skills
- Increased Positive Attitude Toward Science
- Improved Inquiry-Based Teaching Skills
- Increased Confidence and Professional Pride
- Utilization of Inquiry-Based Materials

Student Impact

- Improved End-of-Grade Test Scores in Science, Math, and Language Arts
- Enhanced Content Knowledge and Process Skills
- Decreased Academic Performance Gaps
- Increased Enrollment in Higher-level Math and Science Courses
- Increased Student Engagement in Active Learning
- Integrated Learning Across Curricular Areas



The NC-ISE Program is based on a research-based national model developed from experiences of highly successful school systems across the US. The success of these systems was found to depend on the implementation of **five key elements** The five elements are (1) a strong inquiry based curriculum based on National Science Education Standards (which NC has), (2) research based inquiry materials (science kits now on state adoption list for 2005), (3) continuing professional development for teachers and leaders, (4) student assessment, both formative and summative(contained in science kits and science notebooks), and (5) administrative and community support. This NC-ISE pyramid demonstrates how these five elements can be implemented in North Carolina.

Think of these five elements as the five fingers of your hand, all working together to produce a successful sustainable program. If you removed your thumb think how much more difficult it would be to get the job done. If you don't have all five elements working together the results are lacking.

NC-ISE begins by working with the system leaders to develop a science improvement plan. The first four rungs of the pyramid thus lay the foundation for future success. Once the science plan and a working science committee are in place we are ready to begin working with the teachers. Professional development for teachers must be on-going. We later provide several levels of teacher professional development to enable the system to become self sustaining.

What we hear!

"If I had known we were doing science today I wouldn't have skipped school."

9th Grade Student

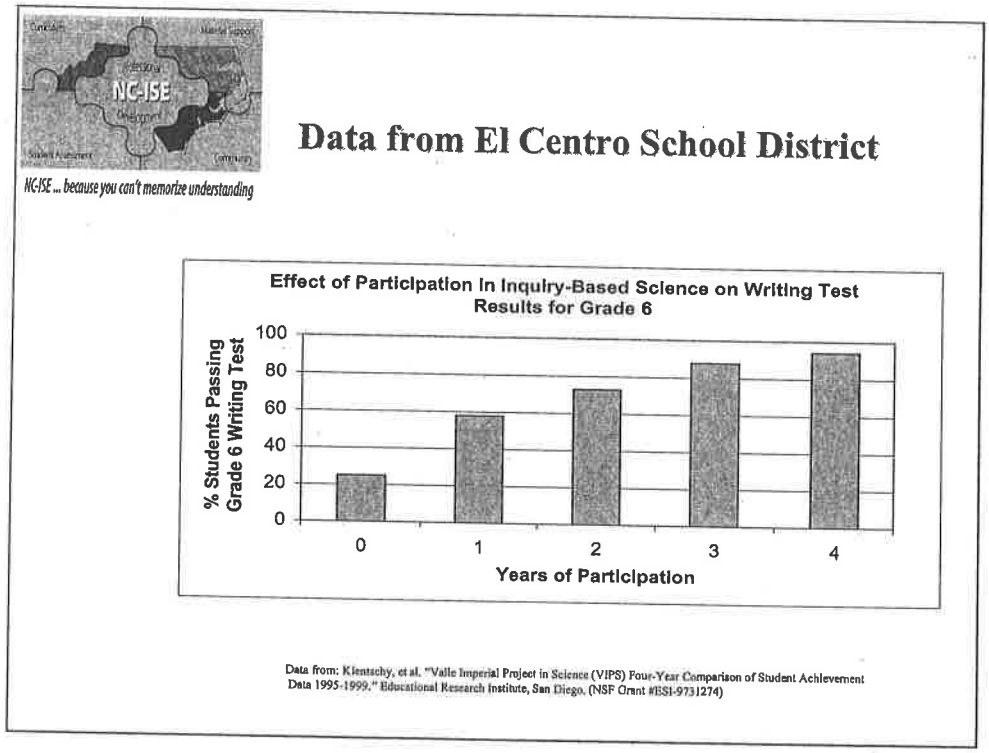
"When we do the inquiry science kits, not only do my students have everything they need to learn science, but I have 100% attendance."

Teacher from Graham County

Notes

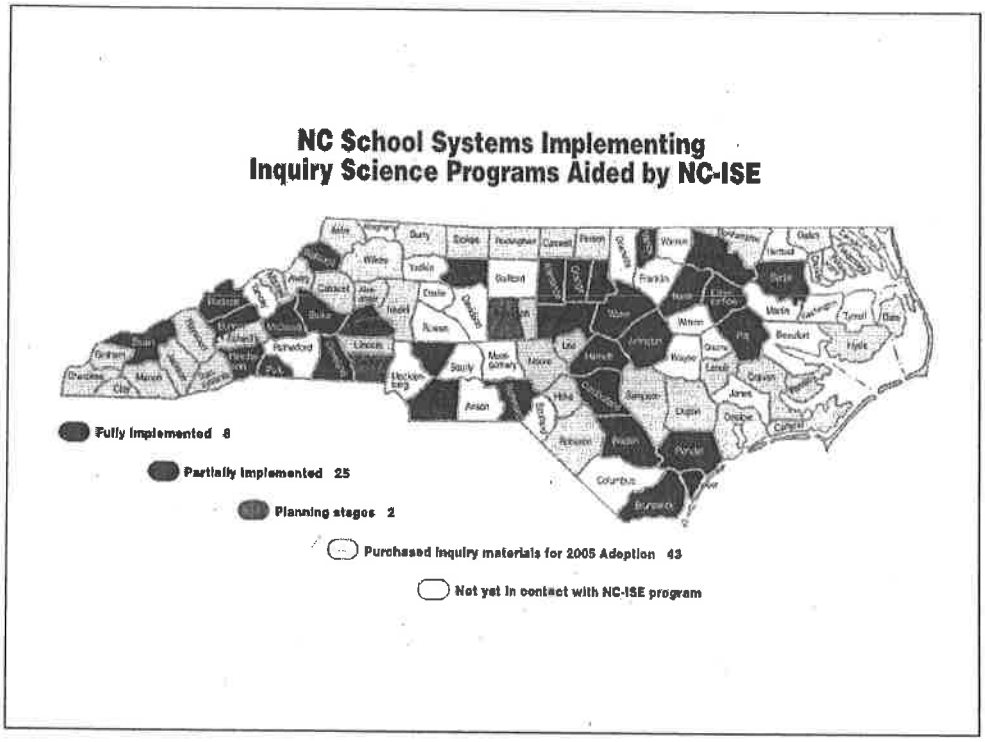
These are two of many anecdotes we have collected about the impact of inquiry-based science in NC schools. With adequate funding for research we can move from anecdotes to hard data to asertain the effectiveness of our NC programs to create a science-based workforce.

Since we don't yet have such data for NC, I would like to share some data from a school system in California tha alreadyt has a strong inquiry-based science program. We should note that this school system has a student population that is 80% free and reduced lunch and 82% non-english speaking.



Research in this California system has shown that student writing improves significantly with continued experience in inquiry-based science.

In the El Centro district student test scores showed that increased achievement in writing is correlated with increased exposure to inquiry-based science. During this period there were ot other significant changes to the writing curriculum.



So I know you want to know how your school system is doing.

Lets take a look at the NC-ISE map of implementing school systems.

The 8 school systems shown in red are fully implemented systems.

some of these system started implementation in 1999.

The 23 school systems in blue are in various stages of implementation. Some are trying to do it without full administrative support and are moving at a slower pace.

The 2 school systems in the planning stage did not purchase either inquiry materials or textbooks in the 2005 adoption. They are building their program using the steps of the NC-ISE pyramid.

The 43 school systems in yellow have shown that they are interested and have purchased inquiry materials during the 2005 adoption. They will need more help with plans and leadership building to be successful.

The first important point is that : only 8 systems have achieved full implementation. We have a long way to go.

A second important point: 81 of our 114 school systems recognize the importance of moving in this direction but they still have a long way to go also.

Some Challenges

- Science achievement is not considered to be a high priority by the state.
- Science education is not understood as an important stimulus for student achievement in non-science subjects.
- Science is not adequately recognized for its contributions to equity and closing the achievement gap.
- Funding for curriculum materials to begin implementation is inadequate.
- It is not understood that, once implemented, the cost of maintaining materials-based science instruction may be more economical over time, than textbook centered instruction.

Cite Cabarrus County data

Recommendations

- Acknowledge and communicate the impact of inquiry-based science instruction on student achievement in reading, writing, math and technology and encourage integration of science with other important curricular areas.
- Encourage different groups engaged in science education to identify and work toward common goals.
- Recognize and build upon the existing initiatives, such as NC-ISE, to boost NC's head start on the recommendations of national educational studies for improving the pool of talent in science, technology, engineering and mathematics.

How do we build a culture in NC that recognizes and capitalizes on the impact inquiry-based science can have?

Proposed Actions

- In policy decisions, bring together educators and business representatives who have experience with implementing and sustaining successful inquiry-based science programs.
- Create a NC DPI position to coordinate and institutionalize inquiry-based science instruction across NC.
- Fund research on NC implementing systems to document the effectiveness of inquiry-based science on student achievement and on closing the gap.
- Study the costs and ways for establishing and maintaining inquiry-based instructional materials for school systems across NC.

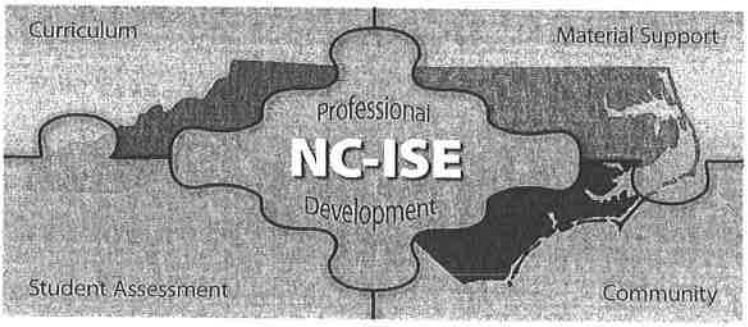
Notes

A strong foundation in science and mathematics in the elementary grades is essential to ensure student success in these subjects in middle and high school. But we have failed to emphasize science in the early grades.

We need to shift our focus to strong programs in science and math in early grades to ensure student success at higher levels and to provide a skilled work force.

Inquiry is Important

Because you can't memorize *UNDERSTANDING!*



NC-ISE ... because you can't memorize understanding

Questions?

What is inquiry in education?

The *Standards* note:

Inquiry is a multifaceted activity that involves making observations; posing questions; examining books and other sources of information to see what is already known; planning investigations; reviewing what is already known in light of experimental evidence; using tools to gather, analyze, and interpret data; proposing answers, explanations, and predictions; and communicating the results. Inquiry requires identification of assumptions, use of critical and logical thinking, and consideration of alternative explanations. (p23)

Literature Review that Supports the Integration of Inquiry Science and Literacy

- **To date, literacy programs have focused on how children develop knowledge *of* literacy, rather than knowledge *through* literacy (i.e., the integration of literacy with inquiry science).**
  Neuman, S. (2001). The role of knowledge in early literacy. *Reading Research Quarterly*, 36(4), 469-475.

- **Recent research supports a lack of content knowledge aligns with early reading failure.**
  Neuman, S. (2001). The role of knowledge in early literacy. *Reading Research Quarterly*, 36(4), 469-475.

- **It has been found that, an average, 1st grader spend only 3.6 minutes a day reading "informational text"**
  Duke, N. (2000). The scarcity of informational text in first grade. *Reading Research Quarterly*, 35, 202-224.

- **The statistic above might actually be much lower since it has been shown that many teachers are unable to distinguish the characteristics that actually define true informational text.**
  Douville, P., Pugalee, D.K. & Wallace, J. (2003). Examining instructional practices of elementary science teachers for mathematics and literacy integration. *School Science and Mathematics*, 103(8), 388-396.

- **Contemporary research now focuses on an integrated approach that supports how literacy is influenced by new information gained through the disciplines (i.e., science).**
  Stanovich, K.E. (2000). *Progress in understanding reading.* New York: Guilford Press.

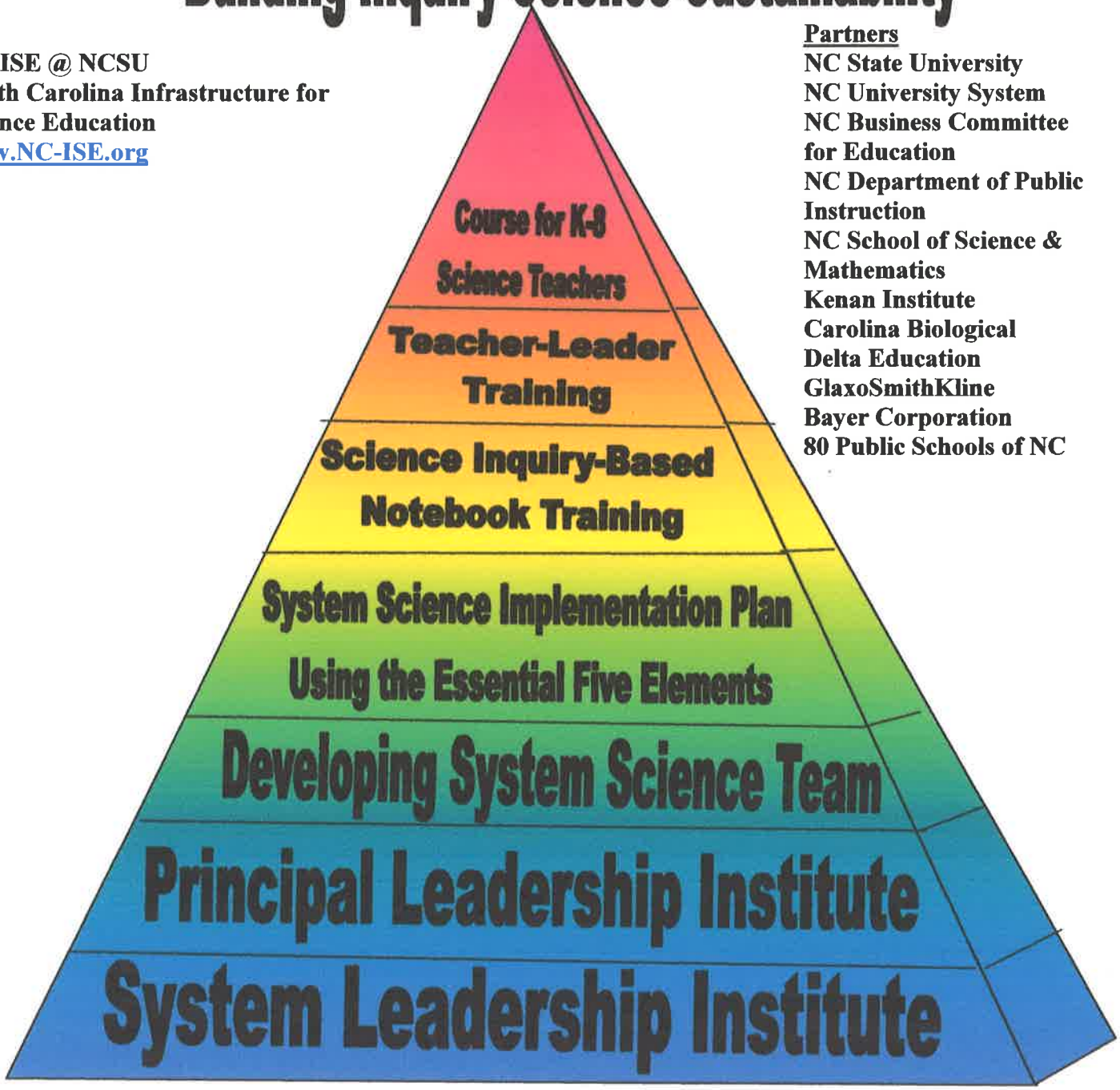
- **The integration of science and literacy results in a learning process that is more dynamic and, consequently, stimulates students' motivation for learning.**
  Guthrie, J.T., Anderson, E., Alao, S. & Rinehart, J. (1999). Influences of concept-oriented reading instruction on strategy use and conceptual learning from text. *The Elementary School Journal*, 99(4), 344-366.

- **Unfortunately, research findings indicate that elementary teachers rely primarily on the teacher editions of textbooks to teach science. An analysis of teacher editions of texts reveals that content area textbooks do not help students become strategic readers.**
  Kragler, S., Walker, C.A. & Marin, L.E. (2005). Strategy instruction in primary content textbooks. *The Reading Teacher*, 59(3), 254-261.

NC-ISE ... because you can't memorize understanding

Building Inquiry Science Sustainability

NC-ISE @ NCSU
North Carolina Infrastructure for Science Education
www.NC-ISE.org



Partners
NC State University
NC University System
NC Business Committee for Education
NC Department of Public Instruction
NC School of Science & Mathematics
Kenan Institute
Carolina Biological
Delta Education
GlaxoSmithKline
Bayer Corporation
80 Public Schools of NC

School Systems Interested in and Implementing Inquiry based Science Kits

STATUS Fully-Implementing(F)/ Implementing (I)/ Interested (IN)	SCHOOL SYSTEMS	CONTACT	POSITION
I	Alamance - Burlington Schools	James Merrill	Superintendent
IN	Alexander County	Jack Hoke	Superintendent
IN	Ashe County	Nancy Reeves	Director of Curriculm and Instruction
IN	Asheboro City Schools	Allen Johnson	Superintendent
IN	Asheville City Schools	Michael Wyant	Director of Secondary Education
		Vicki Dineen	Director of Elementary Education
IN	Avery County	Steve Sneed	Assistant Superintendent C&I
I	Bertie County	Bobbie Parker	Coordinator of Instruction
I	Brunswick County	Faye Nelson	Elementary Staff Development
I	Buncombe County	Alan Lenk	
		Michele Fagan	Assistant Superintendent of Instruction
I	Burke County	Susan Wilson	Director of Elementary Education
F	Cabarrus County	Jacqueline Whitfield	Director of Elementary Education
IN	Caldwell Co Schools	Susan Morgan	Science Curriculum Specialist
IN	Carteret County Schools		
IN	Caswell County	Sherril Barrett	Teacher
I	Catawba County	Michael Wyant	Principal High School
		Kim Penley	Principal Elementary
	Chapel-Hill/Carrboro Schools	Darlene Ryan	Math and Science Supervisor
F	Chatham County	Donna Melpoder	Lead science teacher
		Jean Blackman-Brauer	Director of Elementary Education
IN	Cherokee County	Jamie Barnett	Lead Science Teacher
IN	Clay County	Scott Penland	Science Teacher
I	Cleveland County	Jane King	Assistant Superintendent of Instruction
		Donna Senter	Director of Elementary Education
IN	Clinton City Schools	Debo Bell	Assistant Superintendent of Curriculum and Instruction
IN	Craven County	Jo Ann Wheeler	Assistant Superintendent of Curriculum and Instruction
I	Cumberland County	Connie Kinlaw	Science Curriculum Specialist, K-5
IN	Dare County	Susan Barnes	
IN	Duplin County	Paul Britt	Superintendent
		Jackie Herring	Director of Elementary Education

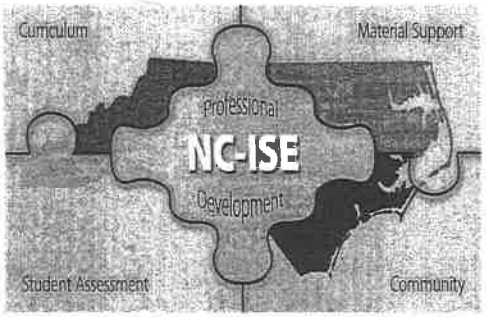
F	Durham Public Schools	Janet Scott	Science Curriculum Specialist
IN	East NC School for the Deaf		
IN	Edenton/Chowan County	Allan Smith	Superintendent
IN	Elizabeth City/Pasquotank	Linda Ward	Director of Elementary Education
IN	Elkin City Schools		
Planning	Gaston County	Sharon White	Instructional Specialist
	Gates County	Zenobia Smallwood	Assistant Superintendent
IN	Graham County	Rick Davis	Superintendent
I	Harnett County	Nancy Helms	
IN	Haywood County	Kathy Boydston	
			Assistant Superintendent of Curriculum and Instruction
I	Henderson County	Anita Owenba	
IN	Hickory Public Schools	Diana Beasley	Teacher
IN	Hoke County	Tina Miller	Assistant Superintendent of Curriculum and Instruction
IN	Hyde County	Aleta Cox	Executive Directof of K-8 Curriculum
IN	Iredell/Statesville Schools	Steven Sheets	Principal
IN	Jackson County	Sue Nations	Superintendent
I	Johnston County	Vickie Boyette	Lead Teacher, K-12
IN	Kannapolis City Schools		
IN	Lee County	Jeffery Cox	Assistant Superintendent of Curriculum and Instruction
IN	Lenoir County		
IN	Lincoln County	Larry Shouse	Principal
IN	Macon County	Chris Reis	Principal High School
I	Madison County	Theresa Banks	Assistant Superintendent
I	McDowell County	Donna Gardner	Elementary Supervisor
IN	Mitchell County	Dana Hollifield	Teacher
IN	Moore County	John Corio	Director Science
IN	Mooresville City Schools	Chuck LaRusso	Curriculum Facilitator
I	Nash-Rocky Mt. Schools	Beezie Whitaker	Director of Elementary Education
IN	NC School for the Deaf- West		
F	New Hanover County	Bob Maxey	
		Maggie Guggenheimer	Elementary Science and Math Specialist
		Karen Greene	Secondary Science Supervisor
F	Newton Conover	Margaret Lundy	Director of Academically Gifted and Elementary Curriculum
IN	Onslow County		
I	Orange County	Mary Alice Yarbrough	

IN	Monroe City Schools		
IN	Pamlico County		
I	Pender County	Walter Gray	Science Curriculum Specialist
IN	Perquimans County	Dwayne Stallings	Assistant Superintendent
		Kenneth Wells	Superintendent
IN	Person County		
I	Pitt County	Dawn Singleton	Director of K-8 Instruction
I	Polk County	Mary Margaret Ingles	Assistant Superintendent
Planning	Randolph Co Schools	Ana Floyd	Lead Math and Science Teacher
I	Richmond County	Debbie Wrenn	Math and Science Curriculum Specialist, K-12
F	Roanoke Rapids City Schools	Anthony Kennedy	Principal
IN	Robeson County	Laura Artis	Instructional Support
IN	Rockingham County	Dianne Campbell	Supervisor Curriculum Test Evaluation
IN	Sampson County	Leslie Hobbs	Assistant Superintendent of Instruction
IN	Stokes County		
IN	Surry County		
I	Swain County	Shirley Grant	Teacher
IN	Transylvania County	Ron Rudd	Director of Curriculm and Instruction
F	Union County	Trudy Griffin	Director of Elementary Education
I	Vance County	Dr. Norman Shearin	Superintendent
		Valerie Alston	Science Specialist
I	Wake County	Cathy Horne	NC-ISE Co-Director, Wake County Public School System
I	Watauga County	Clarissa Schmal	Director of Curriculm, 6-8
		Gail Ford	Director of Curriculm, K-5
IN	Weldon City		
IN	Wilkes County	Steve Laws	Superintendent
F	Winston Salem Forsyth Schools	Alexander Richardson	Elementary Supervisor

Illustration of cost effectiveness of inquiry science materials from one North Carolina county

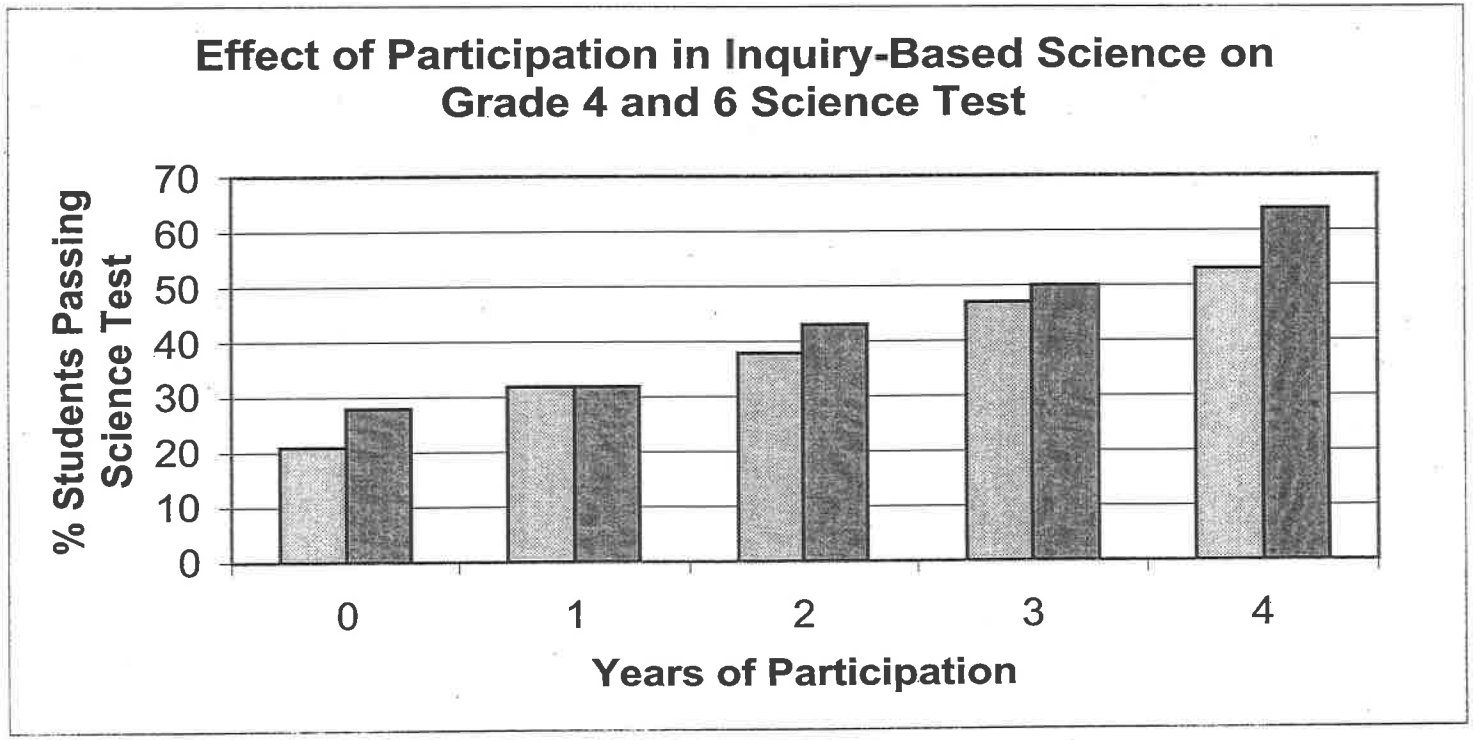
Three-year budget for elementary classroom materials

	2006	2007	2008	3 year total
Reading	$40.63	$17.75	$8.87	$67.25
Math	$16.16	$17.04	$17.75	$51.65
Science	$5.14	$14.37	$5.14	$24.42

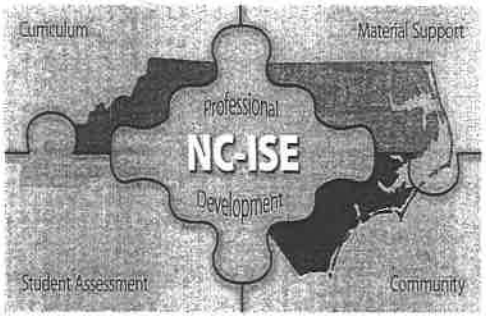


NC-ISE ... because you can't memorize understanding

Data from El Centro School District

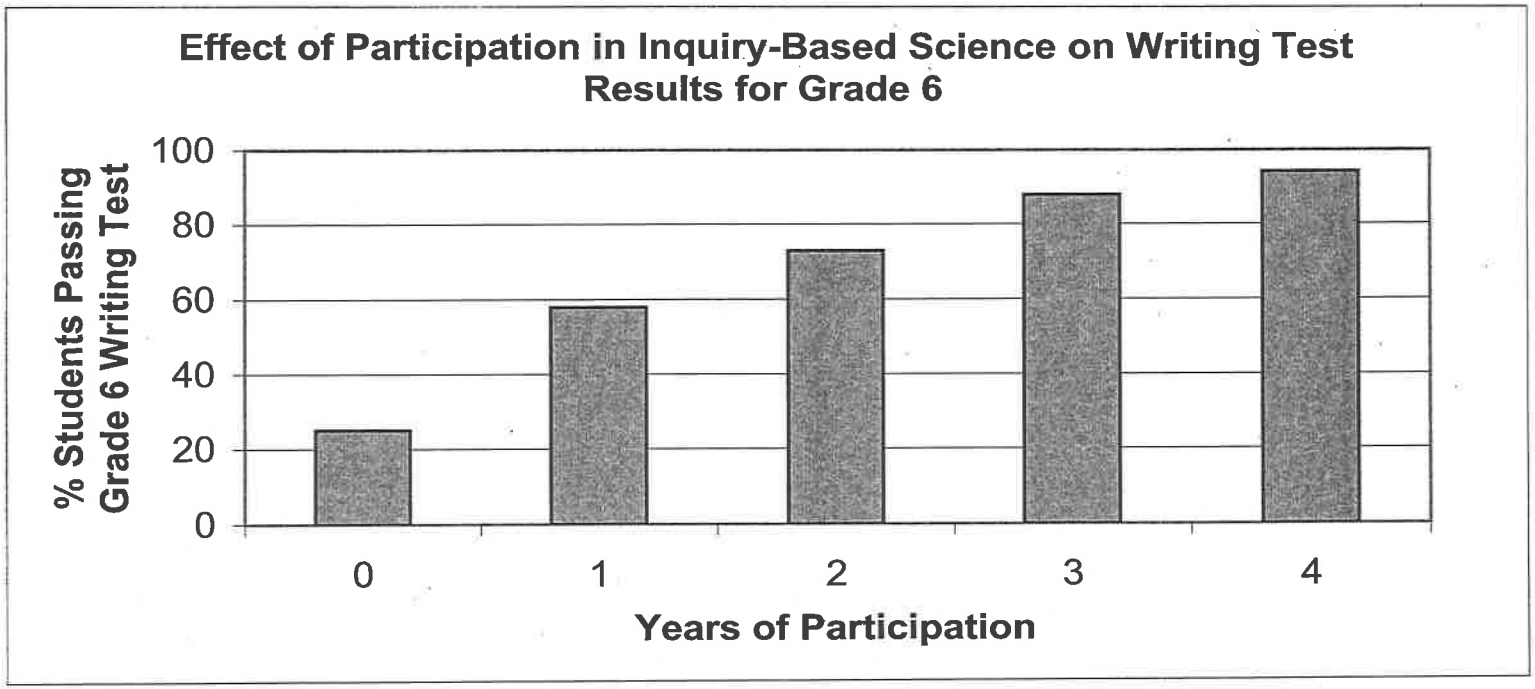


Data from: Klentschy, et al. "Valle Imperial Project in Science (VIPS) Four-Year Comparison of Student Achievement Data 1995-1999." Educational Research Institute, San Diego. (NSF Grant #ESI-9731274)



NC-ISE ... because you can't memorize understanding

Data from El Centro School District



Data from: Klentschy, et al. "Valle Imperial Project in Science (VIPS) Four-Year Comparison of Student Achievement Data 1995-1999." Educational Research Institute, San Diego. (NSF Grant #ESI-9731274)

- The federal No Child Left Behind legislation will make great demands on school performance and may make teacher shortages more acute. However, this legislation presents an opportunity to improve science education at the elementary and middle school levels and close achievement gaps for minority students.

To achieve significant improvement in math and science education in general, as well as to prepare students for biotechnology careers, will require communities and school systems that recognize the importance of science and math education, teachers who are well-prepared and supported, and career education that is better integrated in the curriculum.

Taking advantage of key opportunities

North Carolina has two immediate opportunities that can provide key advantages in strengthening biotechnology-related education.

The North Carolina Infrastructure for Science Education Program

Established in 1999, the North Carolina Infrastructure for Science Education Program (NC-ISE) is a partnership among the Department of Public Instruction, industry groups, and branches of the UNC System. In a cost-effective way, this program educates teachers and school administrators who form partnerships within their communities to support science education. Teachers receive supplies to implement nationally recognized curricula. These measures have led to significant improvements in student learning in other states, and reduced achievement gaps for minority students.

The Gates Foundation grant to create innovative schools

The Bill and Melinda Gates Foundation grant to North Carolina, announced in August 2003, provides $11 million in seed funding to start new schools or reorganize existing schools in new ways to enhance student achievement. Different types of schools will be created, each with a unique design and/or career specialization. The Gates Foundation grant provides a great opportunity to establish schools specializing in biotechnology that could serve as regional models and resource centers for teachers. Such schools should lead to higher graduation rates, particularly for at-risk students; and a higher percentage of students who either pursue higher education or who enter the workforce directly in the school's field of specialization or related areas.

NC-ISE gets K-8 students 'doing science'

For Scott Maxey, an Alderman Elementary School student in New Hanover County, understanding "plant growth and development" became much more interesting when he started doing the cross pollinating himself with a little help from one of nature's most prolific pollinators.

"My favorite thing was when we pollinated flower blooms with bees," he said.

Educators statewide hope to hear that enthusiasm from all students who benefit from the North Carolina Infrastructure for Science Education (NC-ISE) program. Launched in 1998, the program is based on research by the National Science Resources Center that identified seven school systems nationally that had exemplary science programs for five or more years. These schools shared five common elements for success:

- alignment with standards-based curricula
- continuing professional development for teachers to support science content and building confidence in guiding student investigations
- materials support for student experiments through the use of inquiry-based kits deemed effective at teaching science
- support from community, school and district-level administration
- student assessment that is based on learning objectives in the curriculum and how students are taught

Research has shown that student writing improves significantly with continued experience with inquiry-based science. Other studies indicate that the achievement gap between minority and non-minority students closes with continued exposure to an inquiry approach. Presently, about two-thirds of North Carolina's school districts participate in NC-ISE.

Bob Maxey, former math and science teacher who initiated the program in New Hanover County, believes "students must hold science in their hands before they can hold it in their minds." If so, the NC-ISE program can play a critical role in providing the necessary support structure to bring hands-on, inquiry-based science learning to students across the state.

Important Observations

"Inquiry is in part a state of mind ---That of inquisitiveness"

Bruce Alberts, President National Academy of Science

What do high school teachers say? "Please just send us kids that don't hate science"

Susan Spraig, National Science Education Consultant

"Students need to hold science materials in their hands before they can hold concepts in their minds"

Bob Maxey, New Hanover County Schools

"Inquiry Science is important because you can't memorize understanding"

NC-ISE Logo, Brenda Evans, Director NC-ISE

"We have had to make some changes with inquiry science. HS students are selecting more higher level science and math courses so we have had to increase our lab facilities"

Superintendent Mesa Arizona Schools

Two middle schools in one state were surveyed. Enrollment in science was listed as an elective in the seventh grade rather than a required subject. School one: students had been involved in inquiry learning; school two: had a traditional textbook program.

" 94% of students from the inquiry program chose to take science in 7th grade and 4% of students from the traditional program chose to take science in the 7th grade."

Mr. Wizard Foundation Video "Change came to Mesa"

SMT

North Carolina Science, Mathematics, and Technology Education Center

www.ncsmt.org

News | Resources | Events | Networking

The SMT Center supports the work of teachers.

- Uncover new ideas for teaching science, math, and technology
- Locate scientists and engineers willing to mentor students in classrooms and via email
- Find professional development opportunities
- Identify new curriculum materials and research
- Read news and calendar events relevant to science, math, and technology education
- Locate science competitions for students
- Connect with others interested in promoting advanced science and math education
- Benefit from having an advocate for the advancement of science and math education

Key SMT Center Programs:

Teacher Link Program connects K-12 teachers with scientists to generate new content and ideas for teaching science, math, and technology.

Think Science Program trains community leaders to advocate the importance of high quality science and math education in public schools.

Support for **Statewide Science Competitions,** which gives students fun opportunities to put what they've learned in the classroom into practice.

Health Careers High Schools, as part of the New Schools Project, creates highly personalized student experiences, preparing them for health-science related careers.

The SMT Center also:

- serves as a catalyst for innovation in education
- advocates for research-based instructional programs and improved teaching and learning
- provides strategic technical assistance programs
- communicates the status of science, mathematics, and technology education to legislators, the media, and the community at large

Contact us at **919.991.5111** or **smt@bwfund.org** for more information.

Our mission is to provide students in North Carolina with the knowledge and skills necessary to have successful careers, be good citizens, and advance the economy of the state.

NCSMT is providing supporting in various capacities to the following individual schools or LEAs:

Alamance-Burlington School System
Allegheny County Schools
Beaufort County Schools
Carteret County Schools
Chatham County Schools
Cleveland County Schools
Duplin County Schools
Harnett County Schools
Hertford County Schools
Iredell-Statesville School System
Johnston County Schools
Lee County Schools
Lenoir County Schools
Nash Rocky Mount Schools
Onslow County Schools
Pender County Schools
Person County Schools
Public Schools of Robeson County
Randolph County Schools
Roanoke Rapids Graded School District
Rutherford County Schools
Watauga County Schools
Wilkes County Schools
Asheville City Schools – School of Inquiry and Life Sciences
Cumberland County Schools – The Cumberland School of Health Sciences
Granville County Schools – South Granville High School of Health Sciences
Granville County Schools – J. F. Webb School of Health Sciences
Newton-Conover City Schools – Newton-Conover Health Science High School
Scotland County Schools – Scotland County School of Health Sciences
Scotland County Schools – Scotland County School of Engineering and Skilled Trade
Wake County Schools – East Wake School of Health Science
Winston-Salem/Forsyth County Schools – Atkins School of Bio-Technology
Winston-Salem/Forsyth County Schools – Atkins School of Computer Technology
Winston-Salem/Forsyth County Schools – Atkins School of Pre-Engineering
Guilford County Schools – Northwest High School
Asheville City Schools – Asheville High School

What You Can Do Now

Improving science, mathematics, and technology education will require everyone in our state working together. But we can do it—it's within our power to build a culture where the sciences thrive in North Carolina. Some changes will take time; others can be put in place today. Here's how you can help.

Parents

- Get involved at your school. Speak up for stronger math and science classes and teacher development.
- Encourage your kids to sign up for math and science courses every year they're in school. Find out what's offered.
- Volunteer your time—help set up labs, grade papers, go on field trips, speak on Career Day. You'll learn something too!
- Voice your opinion—tell school boards and legislators that the sciences are important to your child's education and future.
- Think science at home: talk about discoveries in the news, visit science museums, and encourage your kids to explore their world, through chemistry sets, microscopes, books, and challenging games.

Educators

- Advocate for more hands-on instruction in your school.
- Make professional development for math and science teachers a high priority.
- Integrate science and math with other subject areas. Take students on educational field trips that show science in action.
- Offer a greater variety of math and science courses at higher levels.
- Reach out to local experts and invite them to your classroom.
- Give parents tips on how to promote math and science at home.

Business and Community Leaders

- Get actively involved in math and science programs at local schools.
- Sponsor science fairs and clubs, competitions and scholarships.
- Develop partnerships with schools.
- Pair up scientists and technicians to mentor students.
- Create high school internships in science-related jobs.
- Introduce students to career possibilities through job shadowing.
- Be a tireless advocate of math and science education in the General Assembly, Department of Public Instruction, and your school board.
- Contribute to science museums and other initiatives to make science come alive for kids.

For more ideas on how you can get involved, please visit our Web site at **www.ncsmt.org.**

Un Nuevo Enfoque para una Nueva Economía

El estado de Carolina del Norte está cambiando rápidamente de una economía industrial a una economía basada en la tecnología e innovación. Estas son buenas noticias–esta transformación económica está creando una gran cantidad de nuevos empleos gratificantes. ¿Estaremos preparados para responder a esta demanda?

Los empleos de mañana—y aún de hoy mismo—requieren un conocimiento a fondo de las ciencias, matemáticas y tecnología. Carolina del Norte necesita preparar urgentemente a nuestros estudiantes para que se incorporen a una nueva fuerza laboral impulsada por la innovación.

¿Cómo? Piense en la Ciencia

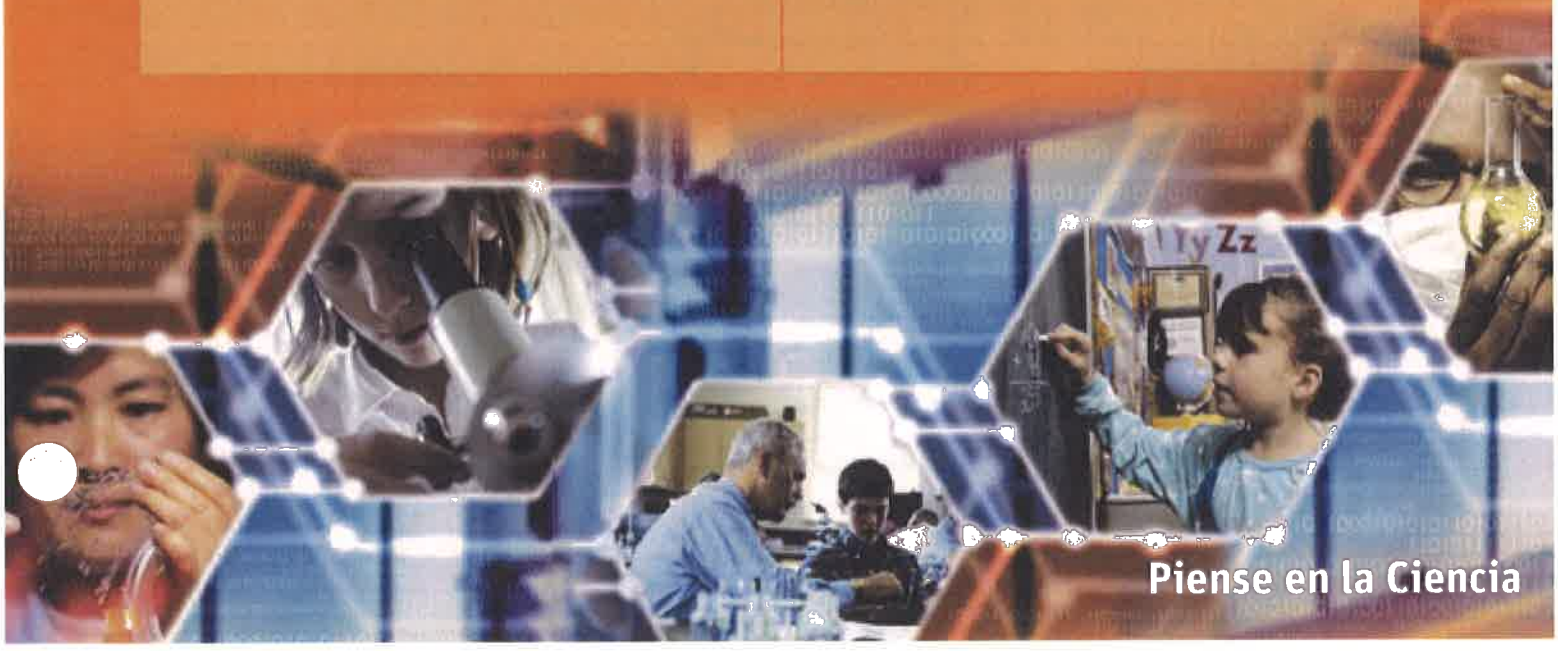
Podemos responder a este reto al ofrecer la mejor educación en las ciencias y matemáticas para nuestros hijos, desde la escuela preescolar hasta la escuela preparatoria (*high school*). Esto incluye instrucción en matemáticas, ciencias biológicas, ciencias físicas y computación.

Nuestra Misión Crítica

- Ofrecer más y mejores cursos de matemáticas y ciencia
- Apoyar la instrucción de alta calidad basada en los mejores métodos
- Promover la instrucción práctica basada en los resultados de la investigación
- Alcanzar a todos los estudiantes desde la escuela preescolar al último año de la escuela preparatoria en todos los niveles por todo el estado
- Educar a los padres de familia y a los que desarrollan políticas sobre la importancia de la instrucción en matemáticas y la ciencia
- Desarrollar colaboraciones enre las escuelas y las empresas para que los estudiantes aprendan cómo se aplican sus conocimientos en el mundo real

Una Ciencia Mejor para una Vida Mejor

La ciencia y la tecnología son parte de nuestras vidas diarias en el trabajo y en la casa. Estamos rodeados de tecnología y descubrimientos, desde los juegos para computadoras a las sorprendentes nuevas medicinas. Cuando pensamos en la ciencia para los estudiantes de Carolina del Norte, estamos trabajando para mejorar las oportunidades de trabajo y creando una vida mejor para todos nosotros.



Los Empleos en la Tecnología Están Aumentando en Carolina del Norte

- Carolina del Norte está entre las cinco regiones más importantes en el campo de biotecnología en la nación.
- Nuestra industria de biotecnología está creciendo entre 10% y 15% al año.
- Carolina del Norte es uno de los cinco centros más importantes para las telecomunicaciones en el mundo.
- Quince por ciento de los ingenieros de sistemas de redes de la nación viven en Carolina del Norte.
- De los 25 empleos con el mayor crecimiento en los Estados Unidos, 24 requieren educación y entrenamiento en ciencia y tecnología.

¿Cómo Puede Ayudar Usted?

Padres de Familia

- Hable a favor de mejorar las clases de matemáticas y ciencias y de preparar a los maestros en su escuela.
- Anime a sus hijos a que se inscriban en cursos de matemáticas y ciencia cada año que estén estudiando.
- Trabaje como voluntario—ayude a preparar los laboratorios, calificar tareas, acompañar a los estudiantes a viajes de estudio y hable con grupos sobre las carreras profesionales.
- Hable con su consejo escolar y sus legisladores acerca de la importancia de las ciencias para la formación y el futuro de su hijo.
- Piense en la ciencia en su casa: hable sobre los descubrimientos que anuncian en las noticias, visite museos de ciencia y anime a sus hijos a que exploren su mundo por medio de juegos de química, microscopios, libros y juegos que hacen pensar.

Educadores

- Proponga más oportunidades para ofrecer instrucción práctica en su escuela.
- Ayude a que el desarrollo profesional de maestros de matemáticas y ciencias sea una prioridad alta.
- Ofrezca una gran variedad de cursos de matemáticas y ciencias de niveles más avanzados.
- Invite a científicos expertos locales a su salón de clases.
- Aconséjeles a los padres de familia sobre cómo pueden promover las matemáticas y la ciencia en casa.

Líderes Comunitarios y de Negocios

- Involúcrese de manera activa en programas de ciencia en las escuelas locales.
- Patrocine ferias y clubes científicos, competencias y becas.
- Desarrolle programas de mentores y prácticas para estudiantes.
- Defienda la instrucción en matemáticas y ciencias en la Asamblea General, el Departamento de Instrucción Pública (*Department of Public Instruction*) y su consejo escolar.

Esta información ha sido proporcionada por el Centro de Educación para Ciencias, Matemáticas y Tecnología de Carolina del Norte (*North Carolina Science, Mathematics, and Technology Education Center*), una organización sin fines de lucro que trabaja para mejorar el conocimiento de las ciencias, matemáticas y tecnología por todo nuestro estado. Para aprender más sobre nuestra misión y cómo puede ayudar, visite www.ncsmt.org.

North Carolina Science, Mathematics, and Technology Education Center
P.O. Box 13901 / Research Triangle Park, NC 27709-3901
919-991-5111 / www.ncsmt.org

Why Science Competitions?

Remember your first scientific discovery - the sense of accomplishment, your excitement when sharing it with others, the desire to learn more? Science competitions offer that experience to thousands of students every year.
Join us in supporting that experience.

North Carolina Science Fair

Science fairs provide an opportunity for students to display the results of their work in science and technology. The fairs are an exhibition of scientific projects prepared and presented by students under the guidance of their teachers and with the help of others interested in science. Students learn to recognize problems, plan experiments, gather and analyze data, and draw conclusions. Often a science project or science fair can spark interest in a student uninspired by routine class activities.

www.ncsta.org/sciencefair

North Carolina Science Olympiad

The North Carolina Science Olympiad (NCSO) involves teamwork, group planning and cooperation, and an emphasis on rich conceptual learning through active, hands-on group participation. Through the NCSO, students, teachers, coaches, principals and parents are all bonded together as a team working towards a goal. NCSO seeks to provide an alternative to the "isolated scientist" stereotype and remind students that science can be fun, exciting and challenging all at the same time.

www.ncsu.edu/science_olympiad

North Carolina Student Academy of Science

The North Carolina Student Academy of Science (NCSAS) fosters interest and excitement in science research among North Carolina students from 6th grade through 12th grade. The current standard course of study for the state of North Carolina includes inquiry as a major focus. NCSAS can support teachers in fulfilling this requirement. Having students prepare a science project on a topic of interest to them is a way to inspire students to discover something new. Schools can form a science club for students who are interested in research or students can join as individuals.

www.ncsas.org

North Carolina Science, Mathematics, and Technology Education Center (NCSMT)

NCSMT promotes and supports innovation in science, mathematics, and technology learning in the state's elementary and secondary schools. Our mission is to provide all children in North Carolina with the necessary knowledge and skills to have successful careers, be good citizens, and advance the economy of the state. We are working with various science competitions to increase participation levels among all grade levels and in all regions of the state.

www.ncsmt.org

Science Education in North Carolina

The number of U.S. high school students taking higher level sciences such as chemistry and physics is at an alarming low. And the number of North Carolina high school students taking higher level science courses by graduation ranks below the national average.*

Course	National Enrollment Average	North Carolina Enrollment Average
Chemistry	59%	55%
Physics	25%	16%

- In 2002, only 26% of NC students in grades 9-12 took chemistry, physics or advanced sciences.*
- According to the National Assessment Governing Board, more than 50% of U.S. students do not take any science course in the 12th grade.

Advanced Placement Courses in North Carolina

- 10% of 12th grade students in North Carolina took an Advanced Placement science exam in 2002.*
- 59% of NC 12th grade students taking an Advanced Placement science exam in 2002 passed the exam.*

North Carolina Students Taking the AP Test in Sciences*

Course	NC Students Taking Exam	% of Grade 12 Students	National % of Grade 12 Students
Biology	3,160	5	3
Chemistry	2,176	3	2
Physics	1,632	2	2

Source: State Indicators of Science and Mathematics Education 2003; The Council of Chief State School Officers.

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The New North Carolina Economy

Where the Jobs Are

North Carolina's economy is one of the fastest-growing in the U.S., thanks to increasing technology-intensive industries. In knowledge-based areas like biotechnology, computer technology, pharmaceuticals and telecommunications, our state is building a reputation for innovation.

But the jobs are available *now*, and we must fill them with qualified employees from entry-level technicians to top-level researchers. And they all require a solid foundation in the sciences. The alternative is losing thousands of jobs to other states or other countries.

The Growth of Biotechnology

According to the North Carolina Department of Commerce:

- North Carolina ranks among the top five biotechnology regions in the nation.
- Our biotechnology industry is growing 10%-15% per year.

North Carolina is the:

- #1 state in contract research organizations
- #2 state in agriculture-bio research and development
- #3 state in bioprocess manufacturing
- #4 state in pharmaceutical products

Information Technology: An Industry on the Rise

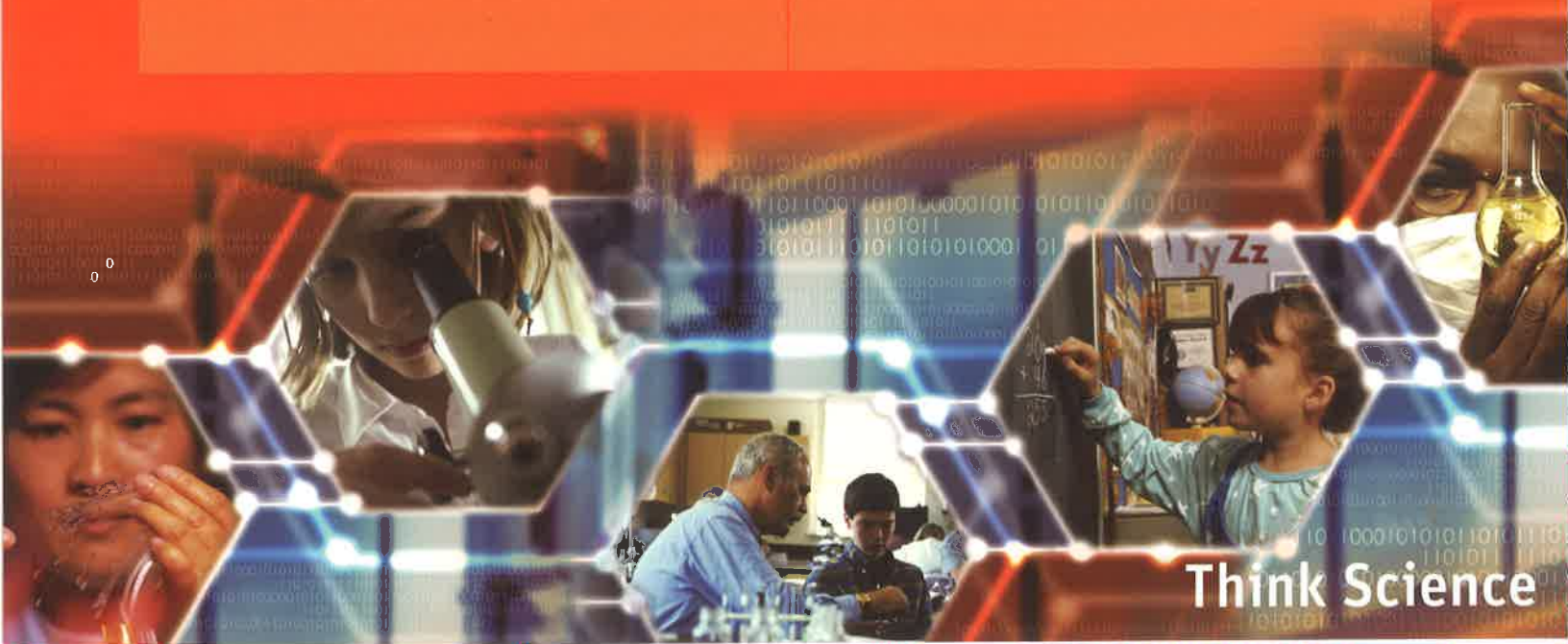
- North Carolina is already one of the top five telecommunications centers in the world.
- North Carolina is home to 15% of the nation's networking engineers (NC Department of Commerce).

Technology Job Growth in NC

According to the NC Board of Science and Technology:

- Technology-intensive jobs grew 3.7% between 1989 and 2000, more than twice the national average of 1.4%.
- Very technology-intensive jobs grew 4.8% between 1989 and 2000, more than twice the national average of 2.3%.
- Despite NC's excellent growth in these jobs, the number of NC private-sector workers employed in technology-intensive jobs in 2000 (11.5%) was below the national average (12.8%).

According to the National Science Board, foreign-born professionals held 22% of all U.S. science and engineering jobs in 2000, up from 14% in 1990.



25 Fastest-Growing Jobs

1. Computer Software Engineers, Applications
2. Computer Support Specialists
3. Computer Software Engineers, Systems Software
4. Computer Security Specialists
5. Network and Computer Systems Administrators
6. Network Systems and Data Communications Analysts
7. Desktop Publishers
8. Database Administrators
9. Personal and Home Care Aides
10. Computer Systems Analysts
11. Medical Assistants
12. Social and Human Service Assistants
13. Physician Assistants
14. Medical Records and Health Information Technicians
15. Computer and Information Systems Managers
16. Home Health Aides
17. Physical Therapist Aides
18. Physical Therapist Assistants
19. Audiologists
20. Computer and Information Scientists, Research
21. Fitness Trainers and Aerobics Instructors
22. Veterinary Assistants and Laboratory Animal Caretakers
23. Occupational Therapist Assistants
24. Veterinary Technologists and Technicians
25. Speech-Language Pathologists

Source: Best Jobs for the 21st Century, Third Edition © 2004, JIST Works, Indianapolis, IN.

Science & Engineering Fields

Aerospace Engineering
Allied Health
Astronomy
Astrophysics
Biochemistry
Bioinformatics
Biomanufacturing
Biomedical Engineering
Bioprocessing
Biotechnology
Cell & Development Biology
Chemical Engineering
Chemistry
Civil Engineering
Computer Science
Ecology, Evolution & Behavior
Electrical Engineering
Genomics
Geosciences
Immunology
Industrial Engineering
Information Technology
Marine Biology
Materials Engineering
Materials Science
Mathematics
Mechanical Engineering
Molecular & Genetic Sciences
Molecular Biology
Nanotechnology
Neurosciences
Nuclear Physics
Oceanography
Optoelectronics
Pharmacology
Physics
Physiology
Proteomics
Statistics/Biostatistics
Veterinary Medicine

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Mathematics Education in North Carolina

North Carolina has made major gains in mathematics proficiency, but it is still too low to support the transition to a knowledge-based economy.

- In 2003, only 32% of 8th grade students in North Carolina were proficient in mathematics, and only 7% were on an advanced level.*
- Among NC 4th graders, only 41% were proficient in mathematics, while 6% were on an advanced level.
- In 2002, nearly every student in North Carolina took a math course, but only 59% took a higher level math course.*

Students taking higher-level mathematics courses in North Carolina

- Trigonometry 68%
- Algebra 2 73%
- Geometry 95%

Advanced Placement Courses

- 9% of NC 12th grade students took an AP exam in mathematics in 2002.*
- 67% of NC students taking an AP exam in mathematics passed the exam in 2002.*

Course	NC Students Taking Exam	% of Grade 12 Students	National % of Grade 12 Students
Calculus	5,932	9	7

Source: State Indicators of Science and Mathematics Education 2003; The Council of Chief State School Officers.

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