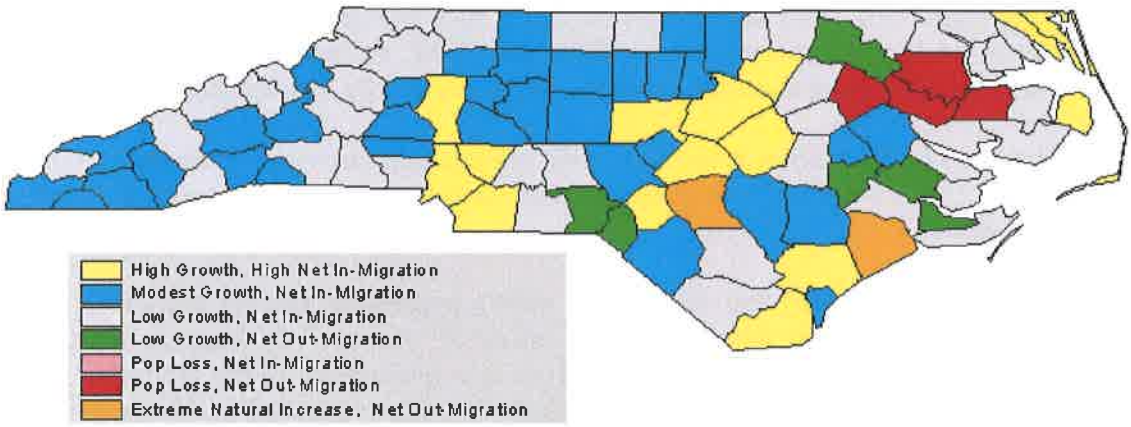
The population growth is not uniform in the state however. As of July 1, 2004, North Carolina had a population of 8.5 million, 50% in the rural counties and 50% in urban areas.[58] Figure 3.C.2 below shows the distribution of population growth projected through 2010.

Figure 3.C.2 Growth 2000-2010 by County



Source: http://demog.state.nc.us

North Carolina experienced rapid growth (21%) in the 1990s. In 1990-2000, only 2 counties lost population (East and Northeast Regions). Most parts of the state shared in population growth, although most rural Eastern and Northeast counties grew significantly more slowly (10% and 8% respectively).[59] Overall, North Carolina's growth was fueled by in-migration from other states and countries, accounting for 70% of the increase. Urban adjacent and high amenity counties grew the fastest.[60]

However, population growth slowed dramatically in 2000-2003. Nineteen counties either lost population or had no growth, all of them on the coast and all rural. Urban shift is apparent[61] with out-migration of younger and more educated/trained people. Some of the decline is associated with military facilities. Some is associated with decline in jobs in furniture. In some other Northeastern counties this trend has been apparent for some time, mostly from a lack of in-migration.

Structural Change and Displaced Workers

North Carolina is in the midst of a major restructuring of its economy. For many years, North Carolina and other southern states have competed for branch offices and manufacturing plants, citing low labor costs and low cost of living. In the past ten years, the weaknesses of this strategy have become apparent with the acceleration of a three-decade long decline in manufacturing due to international competition and the impact of NAFTA. As shown in Figure 3.C.3 on the next page, manufacturing accounted for almost 30% of North Carolina employment in 1970. Now it accounts for only 17%.[62]

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[58] www.ncatlasrevisited.org, accessed 1/31/05.
[59] NC Rural Center, www.ncruralcenter.org, accessed 1/31/05.
[60] NC Rural Center, www.ncruralcenter.org, accessed 1/31/05.
[61] www.ncatlasrevisited.org, accessed 1/31/05.
[62] Bureau of Economic Analysis, www.bea.gov, accessed 1/31/05.

Figure 3.C.3 Manufacturing Decline

Source: www.ncruralcenter.org/databank/trendpage_employment.asp

Textiles, apparel and furniture manufacturing have been the hardest hit in North Carolina. One hundred ninety textile and apparel mills closed during the three year period 2000 to 2003 and an additional 125 mills laid off workers.[63] According to the North Carolina Employment Security Commission, there have been a total of 2,613 announced closings in North Carolina since 2000 affecting over 115,000 people and 1,161 cutbacks affecting another 85,757 people.[64] Layoffs have occurred all over the state, but 34% have impacted the Piedmont Triad region.[65]

In North Carolina, workers displaced by the layoffs in the traditional manufacturing sectors are disproportionately less educated than their peers. According to the Commerce study, 20.3% of workers displaced between January 1999 and June 2001 had less than a high school education; 59% had completed high school; and only 18% had some college or had completed college. This is because the declining industries offered low-skill and low-wage jobs. Displaced workers "tend to have lower education levels than are minimally required in more technically advanced manufacturing and higher level service industries."[66]

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[63] NC Rural Center, www.ncruralcenter.org, accessed 1/31/05.
[64] www.ncesc.gov, accessed 1/31/05.
[65] Watt, Graham, North Carolina Displaced Workers Study, Department of Commerce, May 2002.
[66] Center for Regional Economic Competitiveness, "Situation Analysis of the Future Forward Study Region: 10th and 11th Congressional Districts of North Carolina," February 2003, page 46.

Displaced workers are more than 1.7 times as likely to be Black, and although an equal number of men and women are laid off, men were able to regain employment at a rate more than 10% higher than women. Displaced workers are also older: 41.6% are 30-44; 23.1% are 45-55 and; 13.1% are over 55.[67]

Another structural change affecting North Carolina is the decline in tobacco production and manufacturing. The overall number of farms has dramatically decreased, but this has been particularly pronounced for tobacco production.[68] As recently as 1997, North Carolinians raised over 700 million pounds of tobacco. Although still leading the nation, North Carolina saw its tobacco production drop to 310 million pounds in 2003. The tobacco buy out will further decrease this production. Those moving from farm occupations to other industries will require additional training.

North Carolinians now work more predominantly in service industries. 43% work in service, 20% in trade, transportation and utilities, and 17% in manufacturing.[69] This is a major change from 1990 when manufacturing, construction, natural resources and mining accounted for 40% of employment.

Against these structural decreases in the economy come signs of new economic growth. New industries, particularly those fueled by innovation in information technology, health care and pharmacology spurred growth in employment from 1990 to 2002 at 28% in urban areas, but only 16% in rural North Carolina.[70]

The biopharmaceutical industry is highly concentrated in the Research Triangle Region, and is one of the fastest growing sectors of the North Carolina economy, growing 28.2% in the past ten years. Nationwide, this industry employed over 25,000 Ph.D. and other highly trained workers directly in 2003 and over 127,700 jobs were attributable to this sector that year.[71]

North Carolina is increasingly split between the prosperity of the urban areas and rural counties and between white North Carolinians and other minorities. With a labor force of over 4.2 million in February 2005, North Carolina has an overall unemployment rate of 5.9%. Thirteen rural counties had unemployment rates above 8%. Most of these counties were in the Southeast and near Charlotte, areas most affected by textile, apparel and furniture closings. [72]

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[67] Watt, Graham, North Carolina Displaced Workers Study, Department of Commerce, May 2002.
[68] USDA, NC Rural Center, www.ncruralcenter.org, accessed 1/31/05.
[69] NC Rural Center, www.ncruralcenter.org, accessed 1/31/05.
[70] NC Rural Center, www.ncruralcenter.org, accessed 1/31/05.
[71] Milken Institute, "Biopharmaceutical Industry Contributions to State and US Economics," October 2004.
[72] www.ncesc.com/lmi/laborstats/LaborStatsMain.asp, accessed 4/18/05.

Diversity and Poverty

North Carolina has a diverse population: 72.1% White; 21.6% Black; 1.2% American Indian; 1.4% Asian; 4.7% Hispanic.[73] Blacks continue to be the largest minority group, with over 30% of the population along the coast. The Hispanic population is growing very quickly, up 333.1% or over 300,000 new residents from 1990-2000. About half of these Hispanics settled in rural counties.[74]

The median household income in North Carolina was $39,184 in 2000,[75] compared to the U.S. median of $41,994 for the same year.[76] Again, there was a major disparity by race: the median household income for Whites was $42,530; Blacks: $27,845; Asians: $49,497; and Hispanics: $32,353.[77]

Almost 1 million people lived in poverty in North Carolina in 2000.[78] The poverty rate in North Carolina, 12.3%, is approximately the same as the U.S. average of 12.4%[79]. However, 23 rural counties, basically on the coastal plain and far west, have poverty rates over 18%. And, 22.9% Black, 21% American Indian, and 25.2% Hispanic residents live in poverty in North Carolina.[80]

The Bureau of Labor Statistics projects that the national Hispanic labor force will be larger than the Black labor force by 2010,[81] primarily because of faster population growth due to immigration and increased labor force participation rates. These trends are likely to be reflected in North Carolina. However, historically, the Hispanic population is among the least well-educated, and therefore is an important target for upgrading educational levels and job skills.

Education and the Workforce

Education and workforce preparedness continues to be an issue in North Carolina. As shown in Table 3.C.4, the percent of North Carolina population 18 and older with a high school diploma or bachelors degree is lower than the rest of the South overall and the nation as a whole.

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[73] NC Rural Center, www.ncruralcenter.org, accessed 1/31/05.
[74] http://demog.state.nc.us/demog/hisp9000.html, accessed 1/31/05.
[75] NC Rural Center, www.ncruralcenter.org, accessed 1/31/05.
[76] www.factfinder.census.gov, accessed 1/31/05.
[77] NC Rural Center, www.ncruralcenter.org, accessed 1/31/05.
[78] NC Rural Center, www.ncruralcenter.org, accessed 1/31/05.
[79] www.factfinder.census.gov, accessed 1/31/05.
[80] NC Rural Center, www.ncruralcenter.org, accessed 1/31/05.
[81] Fullerton, Howard N and Toossi, Mitra. 2001. "Labor Force Projections to 2010: Steady Growth and Changing Composition." Monthly Labor Review. http://www.bls.gov. Accessed March 30, 2005.

But, North Carolina's population is becoming more educated. Table 3.C.5 shows a higher percentage of high school graduates among those 25-44 compared with other age cohorts. The educational attainment among the 25-44 year old cohort approaches the national averages given in Table 3.C.4, suggesting that the younger members of North Carolina's workforce are almost as well educated as the U.S. as a whole. A similar trend is evident for bachelors degrees.

Table 3.C.4 North Carolina Educational Attainment, 2004, Percent of Population 18 and Older

	Population (thousands)	Percent high school graduate or higher	Percent bachelor's degree or higher
North Carolina	6,171	80.2%	21.1%
South	76,900	82.2%	23.1%
National	214,700	84.2%	25.2%

Source: www.census.gov/population/www/socdemo/education/cps2004.html. Tables 12 and 14, accessed 12/25/2005.

Table 3.C.5 North Carolina Educational Attainment, 2004, Percent of Population 18 and Older

Age	Population (thousands)	Percent high school graduate or higher	Percent bachelor's degree or higher
18-24	857	75.5%	6.5%
25-44	2,339	85.8%	24.7%
45-64	2,019	83.5%	27.7%
65 and over	956	63.9%	11.4%
All 18 and over	6,171	80.2%	21.1%

Source: www.census.gov/population/www/socdemo/education/cps2004.html. Table 14, accessed 12/25/2005.

Another challenge is that educational attainment by different race and ethnic groups varies widely. Table 3.C.6 shows that blacks and Hispanics have lower education attainment levels than whites and Asians, with Hispanics being dramatically lower. Retention and graduation rates for minority students consistently lag those of all students. This "achievement gap" is a major economic development and workforce preparedness issue.

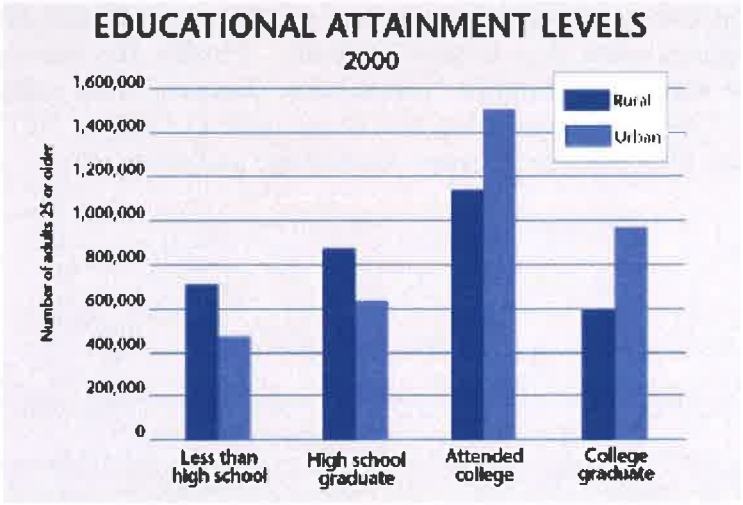
Table 3.C.6. North Carolina Educational Attainment, 2004, Percent of Population 25 and Older

	Population (thousands)	Percent high school graduate or higher	Percent bachelor's degree or higher
Male	2,556	79.6%	24.3%
Female	2,757	82.2%	22.6%
White alone	4,044	81.9%	24.4%
Black alone	1,029	76.5%	18.5%
Asian alone	114	87.4%	40.0%
Hispanic (of any race)	318	46.8%	8.0%
Non-Hispanic White alone	3,746	84.8%	25.7%

Source: www.census.gov/population/www/socdemo/education/cps2004.html. Table14, accessed 12/25/2005.

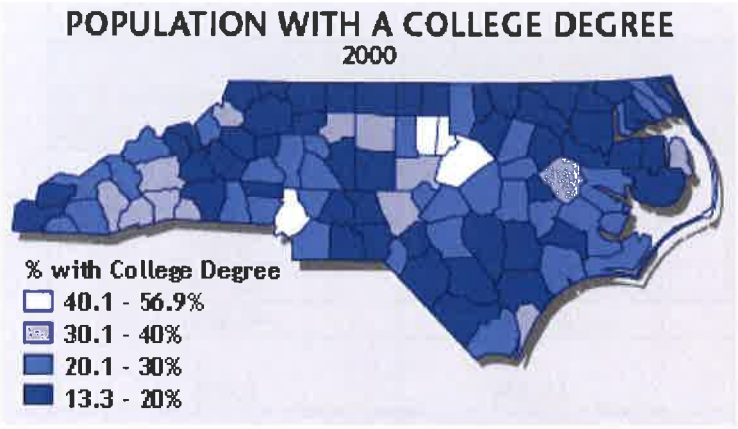
There is a big difference in educational attainment between rural and urban areas of the state. However, the rural populations are also older and have a higher percentage of minorities, both of which also have lower levels of educational attainment. This is illustrated in Figures 3.C.4 and 3.C.5

Figure 3.C.4. Educational Attainment Levels



Source: www.ncruralcenter.org/databank/trendpage_education.asp

Figure 3.C.5 Population with a College Degree by County



Source: www.ncruralcenter.org/databank/trendpage_education.asp

Summary

With the changes occurring in North Carolina's demographics and economic situation, at least four distinct groups of potential students for UNC and NCCCS are emerging. By 2010, the traditional postsecondary cohort of 18-24 year olds will reach about 1 million, slightly over a 20% increase from 2000.[82] In addition, displaced workers from the traditional industries, who are generally less well educated than their peers, will require retraining to gain employment in growing industries. Third, training in English and math will be required for many North Carolinians who are underprepared for postsecondary education. This could also include a substantial percentage of the over 600,000 North Carolinians who speak a language other than English at home.[83] Finally, the increasing pace of change in knowledge requires lifelong or "just-in-time" learning. This suggests that many members of North Carolina's population will come back to UNC or NCCCS during their lives, perhaps more than once, to gain new knowledge and skills.

82 http://www.demog.state.nc.us, accessed 4/18/05.

83 US Census 2000, "Language Use and English Speaking Ability: 2000," C2KBR-29, issued October 2003. www.census.gov/population/www/socdemo/lang_use.htm, accessed 4/18/05.

4. CURRENT EDUCATIONAL ENVIRONMENT

4A. NORTH CAROLINA COMMUNITY COLLEGE SYSTEM

Overview of System

The North Carolina Community College System (NCCCS) is comprised of 58 comprehensive community colleges. (See Attachments 1 and 2 of this report, and referenced in Attachment 5 of this report as Appendix 4.A.1). The 21-member State Board of Community Colleges provides state-level governance and each College has a local board of trustees. The current governance and administrative structure was approved by the 1963 General Assembly. To increase access, the Community College Statutes authorize and encourage the use of off-campus facilities and thus Community Colleges are for commuting students. Therefore, there are no residence halls at any of the Colleges. Further, 45 of the Colleges have off-campus facilities that are approved by the State Board of Community Colleges. Of North Carolina's 100 counties, 90 have facilities operated by the Community Colleges. In 2005-2006, total funding for the System originated from the following sources: state 67.3%, local 13.5%, tuition and fees 15.3%, federal 2.4%, and other 1.5%.

The "Statement of Purpose" section of the community college law states: "The major purpose of each and every institution.... shall be and shall continue to be the offering of vocational and technical education and training, and of basic, high school level, academic education needed in order to profit from vocational and technical education ....." (for students who have left the public schools). This wording was included in the law to allay the concern that liberal arts offerings might overshadow vocational and technical training.

The 2004-2005 System enrollment was 797,341 (unduplicated headcount). During this enrollment period, approximately one-third of the students were in curriculum programs that led to a degree, diploma, or certificate. Converting the unduplicated headcount to full-time equivalents (FTE) yields the following breakdown: 215,608 total full-time equivalent students, with 78% of the FTEs being earned in curriculum or credit programs. Over the past five years, total headcount enrollment has increased by over 3% and FTE enrollment by over 22%. Minority students comprise slightly over one-third of curriculum students and about the same proportion in continuing education programs.

The State Board of Community Colleges has designated service areas for each College, so as to assign specific geographic areas for each institution. These assignments also include a coordination procedure, whereby a College may offer courses in another College's service area when there is mutual consent and written agreement (Section 2C.0100, North Carolina Administrative Code).

Current Academic Programs

The North Carolina Community College System offers a comprehensive array of academic programs for students. All 58 Colleges offer workforce education and training, liberal arts or general education, and continuing education ranging from basic literacy skills to advanced training for business and industry. Due to the number and location of Community Colleges, including off-campus facilities, offerings are very accessible for commuting students.

Curriculum Programs

Curriculum programs are offered in over 290 areas, leading to either an associate in arts, associate in science, associate in fine arts, or associate in applied science degree; a diploma, or a certificate. Referenced in Attachment 5 of this report, Appendix 4.A.2 is a program matrix for the curriculum offerings by College. In 2004-2005, a total of 29,910 completions (graduations) were recorded by Community College students. Referenced in Attachment 5 of this report, Appendix 4.A.3. lists completions by program area. These completions are recorded for associate degrees, diplomas, and certificates.

All curriculum programs in the Community College System were revised in 1996-1997. This intensive process involved numerous faculty committees and System Office staff who revised program standards and graduation requirements. Simultaneously, a common course library was adopted for the System and curriculum courses of study were converted from quarter hours to semester hours. The end result was more uniformity across the System, making it easier for students to move from one Community College to another and making it easier to develop the Comprehensive Articulation Agreement with UNC and its constituent institutions (please see page 98).

Certificate programs range from 12 to 18 semester hour credits and can usually be completed within one semester for a full-time student. Associate degree level courses within a certificate program may also be applied toward a diploma or an associate of applied science degree.

Diploma programs range from 36 to 48 semester hour credits and can usually be completed within two semesters and one summer term for a full-time student. Associate degree level courses within a diploma program may also be applied toward an associate in applied science degree.

Most curriculum programs lead to an associate in applied science degree, though there are diploma and certificate tracks. Associate in applied science degree programs range from 64 to 76 semester hour credits. A full-time student can typically complete one of these programs within two years. In addition to technical/major course work, associate in applied science degree programs require a minimum of 15 semester hour credits of general education, and include course work in communications, humanities/fine arts, social/behavioral sciences and natural sciences/mathematics.

Curriculum programs are grouped into the following instructional clusters: Agricultural and Natural Resources Technologies; Biological and Chemical Technologies; Business Technologies; Commercial and Artistic Production Technologies; Construction Technologies; Engineering Technologies; Health Sciences; Industrial Technologies; Public Services Technologies; Transport Systems Technologies; and the College transfer degrees (Associate in Arts, Associate in Fine Arts, and Associate in Science).

In 2004-2005, a total of 17,071 students received associate degrees, 3,910 received diplomas, and 8,929 received certificates. All of these completions were in curriculum programs.

Programs with high completions (250 or more) in combined degrees, diplomas, and certificates in 2004-2005 include: Accounting – 816; Air Conditioning, Heating, Refrigeration – 811; Associate Degree Nursing – 1,965; Automotive Systems – 449; Basic Law Enforcement – 793; Business Administration – 1,347; Carpentry – 279; Computer Programming – 267; Cosmetology – 709; Criminal Justice – 646; Early Childhood Associate – 1,896; Electrical/Electronics – 601; General Occupational – 351; Horticulture – 295; Information Systems – 852; Medical Assisting – 630; Medical Office Administration – 949; Network Administration and Support – 560; Office Systems – 852; Paralegal – 435; Phlebotomy – 278; Practical Nursing – 764; Radiography – 379; Teacher Associate – 326; Truck Driver Training – 327 (all certificate level); and Welding – 421. In 2004, the State Board of Community Colleges: approved five curriculum programs that were new to the System; approved 41 existing curriculum programs for delivery by the Colleges (new to the Colleges, but not new to the System); and terminated 57 curriculum programs due to a lack of enrollment for at least a two-year period.

New programs are established as a response to local and regional labor market needs and student demand. Each program is approved by the State Board of Community Colleges following a regular curriculum approval process for applications submitted by individual Community Colleges. Curriculums are designed and developed by the applying College with input from employers and advisory committee members. Many programs being offered are of regional interest and may be offered by only one or a small number of Colleges within the System. The State Board has a policy that requires Colleges to formally terminate low enrollment or inactive programs.

Community Colleges offer college transfer programs through the Associate in Arts, Associate in Fine Arts, and Associate in Science degrees. In 2004-2005, completions or graduations in these program areas were: Associate in Arts—3,054; Associate in Fine Arts—31; and Associate in Science—450. Over the past five years, college transfer (AA, AS, AFA) enrollment has consistently been at about 22% of total curriculum enrollment.

Forty-three of the Colleges offer the Associate in General Education degree. General education programs are designed for individuals wishing to broaden their education, with emphasis on personal interest, growth and development. The program is not principally designed for College transfer. A total of 422 students completed this program in 2004-2005.

Curriculum enrollment by College, System, and major program area (associate, certificate, diploma, and transitional) is referenced in Attachment 5 of this report as Appendix 4.A.4. Transitional students used to be designated special credit students. These special credit students are: high school students enrolled under the dual enrollment program; part-time students who have not selected a program of study; students on waiting lists to get into selective admissions programs (for example, nursing); and University or College students taking a few summer courses.

The funding for Community College programs is enrollment driven, and it has a one-year lag with funding in any given year being based on the prior year's enrollment. With few exceptions, new programs have to be planned and implemented within these funds. In essence there are no start-up funds to assist a College in starting a new program. This makes it difficult to start new programs, particularly those with high start-up and operational costs. A recent study of the funding formula has recommended changes to the General Assembly that, if approved, would address some shortcomings of the formula. However, it does not address the need for start-up funding for new programs, particularly those to support the education and training needs of emerging industries that will materialize from this study.

Cooperative programs with public school systems enable high school students to enroll in selected college-level courses on a tuition-free basis. In 2004-2005, a total of 21,625 high school students took tuition-free Community College courses through Huskins and dual enrollment programs. The Huskins Bill (named after the legislator who sponsored the legislation allowing enrollment of high school students) and concurrent enrollment policies provide for educational programs and services to foster the effective utilization of available resources and to provide for more comprehensive educational opportunities. Cooperative programming is intended to enhance educational choices for high school students without duplication of services. Students may not take remedial or developmental courses under these policies.

Continuing Education Programs

Continuing education programs include all non-credit offerings, ranging from teaching basic skills (literacy education, English as Second Language, and so on) to a variety of instructional services for business and industry. Approximately two out of every three Community College students are enrolled in continuing education programs, with the majority in basic skills and occupational education and training. Referenced in Attachment 5 of this report, Appendix 4.A.5. gives continuing education enrollment by College, System, and major program area. We next provide descriptions of the various Continuing Education programs.

Basic Skills Education

Providing basic skills education is a major part of the Community College System's mission. This program assists adults to: become literate and obtain the knowledge and skills necessary for employment and self-sufficiency; obtain the educational skills necessary to become full partners in the educational development of their children; and complete a secondary school education. This program provides educational opportunities for adults to improve their reading, writing, mathematics, and communication skills through the five major program components enumerated below.

1. Adult Basic Education (ABE)—A program of instruction designed for adults who lack competence in reading, writing, speaking, problem solving, or computation at a level necessary to function in society, on a job or in the family. Enrollment was 77,881 in 2004-2005.

2. General Educational Development (GED)—A program of instruction designed to prepare adult students to pass the GED tests that lead to a high school equivalency. Enrollment was 16,516 in 2004-2005

3. Adult High School (AHS)—A program of instruction offered cooperatively with local public school systems to help adults earn an Adult High School Diploma. Enrollment was 7,108 in 2004-2005.

4. English Literacy/English as a Second Language (ESL)—A program of instruction designed to help adults who have limited English proficiency achieve competence in the English language. Enrollment was 36,923 in 2004-2005.

5. Compensatory Education (CED)—A program for adults with mental retardation who have not had an education or who have received an inadequate education. Students enrolled in the CED program are tested and placed in one of the above programs/skills levels.

Training for Business and Industry

A major part of the continuing education program provides training for business and industry. This is a priority area for the Community College System. The System Office organization has most services for business and industry located in the Economic and Workforce Development Division. Educational services are provided through five major program areas.

1. Occupational Continuing Education: Students enroll in occupational or workforce continuing education courses to develop skills for a new job or to improve their skills for their current job. In 2004-2005, 230,858 (41%) of the total continuing education students took classes in this program area. Most of these classes are short-term, and cost the student $50-65 ($65 is the maximum fee for these classes, with the exception of a limited number of high cost offerings, which are operated on a self-supporting basis). Approximately three-fourths of these students worked while attending training. Enrollments, which overlap across areas, are clustered primarily in business/industry training (35%), health and safety (36%), and public safety (39%).

   Even though the cost of instruction is comparable in both curriculum and occupational continuing education, there is a significant difference in the FTE reimbursement rate. Because of differences in funding formulas, occupational continuing education is funded at about three-fourths of the funding of curriculum offerings. System-wide, this differential amounted to a little over $20 million in 2003-2004.

2. New and Expanding Industries Training (NEIT): North Carolina pioneered free, customized job training for new and expanding businesses in 1958 and it continues to be one of the nation's most recognized state-supported customized job training programs. The General Assembly has placed the responsibility for this training in the Community College System. Workforce and economic development staff at the System Office and the Colleges work closely with the North Carolina Department of Commerce and local economic developers in economic development activities. Referenced in Attachment 5 of this report, Appendix 4.A.6. gives summary data for this program since 1986. Activity in this program has fluctuated over the years based largely on the economic cycles and expansion demands from the business community. In 2004-2005, Community Colleges provided NEIT services to 164 new and expanding industries and trained 12,398 workers. Funds for this program are managed at the System level and are allotted to specific training projects after application by a sponsoring College and the business for which the training will be done.

3. Focused Industry Training (FIT)—This program was initiated in the 1980s in response to the training needs of existing businesses. Rapid changes in the workplace and in the economy placed pressure on existing businesses to retool their production facilities and retrain their workers. Most of these needs could not be met by the NEIT program. In 2004-2005, FIT offerings were provided by all 58 Colleges (36 colleges, plus 22 others through consortia) to 797 companies. A total of 11,159 workers were trained in 1,205 classes.

4. Small Business Center Network (SBCN): Each of the 58 Community Colleges has a Small Business Center that provides services to local businesses. The Centers provide a wide variety of seminars and workshops, one-on-one counseling, library resources, and referrals to other sources of assistance. Each College receives an allotment of $76,697 and an additional amount ($7,500, $15,500, or $25,000) based performance (2005-2006) to operate its SBC and most Colleges supplement this allotment with funds from other parts of their budgets (over $1 million in 2002-2003). In 2003-2004, the 58 Centers provided the following services: seminars/workshops—2,979 for 44,475 participants; counseling services—18,493; and referrals—5,831. Except during the height of the recent recession when counseling and referrals showed a significant increase, activity over the past five years has been relatively flat.

   In early 2005, the SBCN entered into partnership with the legislatively created North Carolina Military Business Center that has as its purpose increasing private sector business with military bases in the state. The Colleges' Small Business Centers serve as a point of contact for those seeking information on defense contracts with these facilities.

5. Certifications and Recertifications: Over 200 certification and recertification training programs are provided by curriculum and continuing education programs. Distinct program areas serve the continuing education training requirements for licensure, certification, and train-the-trainer services for 30 state agencies requiring certified staff. In addition, 24 North Carolina occupational boards require licensure and certification training offered through Community College continuing education programs.

Human Resource Development

The Human Resources Development (HRD) program provides skills assessment services, employability skills training, and career development counseling to unemployed and underemployed adults. Its courses address six core components: (1) assessment of an individual's assets and limitations; (2) development of a positive self-concept; (3) development of employability skills; (4) development of communication skills; (5) development of problem-solving skills; and (6) awareness of the impact of information technology in the workplace. Historically, the majority of students in this program are unemployed and enroll because they need basic job-seeking skills training courses. HRD programs link to traditional skills training courses in the occupational continuing education area such as clerical skills, customer service, and so on.

Enrollment in the HRD program was 67,694 in 2004-2005. The recent recession caused dramatic increases in enrollment, with the 2004-2005 enrollment being 178% greater than the 2000-2001 enrollment.

Public Safety Training and Education

In 2004-2005, the Community College System provided training to 162,508 paid and volunteer fire fighters and members of emergency medical services units (rescue squads). Training is delivered at Community Colleges and in local fire departments. Service certification is provided in some areas and specialty programs are offered in selected skill areas. Enrollment has increased over 20% over the past five years.

Basic Law Enforcement Training (BLET) is designed to give students essential skills required for entry level employment as law enforcement officers with state, county, or municipal governments, or with private enterprise. This curriculum (for credit) program utilizes State commission-mandated topics and methods of instruction. General subjects include, but are not limited to, criminal, juvenile, civil, traffic, and alcoholic beverage laws; investigative, patrol, custody, and court procedures; emergency responses; and ethics and community relations. Students must successfully complete and pass all units of study which include the certification examination mandated by the North Carolina Criminal Justice Education and Training Standards Commission and the North Carolina Sheriffs' Education and Training Standards Commission to receive a certificate. This curriculum, which is offered at 47 Community Colleges, enrolled 1,637 students in 2003-2004. A significant amount of education and training for law enforcement personnel is also offered through the continuing education program (non-credit).

As noted in the section on curriculum programs, significant numbers of community college students complete A.A.S. degrees in public safety programs, particularly criminal justice, emergency medicine, and fire protection.

Correctional or Inmate Education

In 2003-2004, instruction was provided to inmates in a prison setting by 48 Community Colleges. Programs offered range from basic skills to curriculum courses and programs. Inmate education provided by Community Colleges operates under a special Correctional Education Plan that takes into account high inmate mobility and low student completion rates. This plan was jointly adopted by the State Board of Community Colleges and the Department of Correction that operates the state's prisons and was designed to increase student completion rates by ensuring that course and program lengths are appropriate for the inmate population at any given prison. In 2004-2005, 3,696 inmates were enrolled in Community College curriculum classes and 22,517 took continuing education classes.

Special Initiative: BioNetwork

The Community College System BioNetwork is a new statewide initiative to help meet the specialized workforce training needs of the growing biomanufacturing and pharmaceutical industry in North Carolina. In late 2003, the System, along with UNC and the North Carolina Biosciences Organization secured more than $60 million in funding from the Golden L.E.A.F. Foundation and industry to launch a major biotechnology training and education initiative. Working together as the North Carolina Biomanufacturing and Pharmaceutical Training Consortium (BPTC), UNC and NCCCS will provide an integrated system of workforce training and educational opportunities to prepare North Carolina's workforce for employment in the biomanufacturing, pharmaceutical, and related industries.

BioNetwork's portion of new funds was $8.7 million of startup funding for early implementation. With these funds, a biotechnology office was established in the System Office, six Community Colleges were selected for BioNetwork Competitiveness Centers, and 65 grants were made to colleges for innovation, equipment/facility enhancement, and distance learning. The Centers serve as hubs of expertise and are located in six of the state's seven economic development partnership regions. Each Center has a specific area of responsibility: Bioprocessing; General Pharmaceutical Manufacturing; Agricultural Biotechnology; Continuing Education; Biotechnology Enterprise Catalyst; and Capstone Center.

BioNetwork capstone training will occur in dedicated space in the Biomanufacturing Training and Education Center being constructed on North Carolina State University's Centennial Campus. This facility will enable Community College students to receive specialized training (for example, clean room/aseptic techniques) which individual campuses cannot afford or justify.

To promote collaboration among Colleges, distance learning will be a significant part of the program. Also, a self-contained, advanced scientific mobile laboratory will travel the state, providing specialized hands-on training to incumbent workers and accelerated lab courses for Community College students in remote areas.

PRELIMINARY FINDINGS - NCCCS

1. The North Carolina Community College System through its 58 colleges and numerous off-campus facilities provides accessible education opportunities for students. Ninety of North Carolina's 100 counties have Community College facilities of some sort, approved by the State Board of Community Colleges.

2. Academic programs are comprehensive at all 58 Colleges, ranging from basic literacy education through the first two years of a baccalaureate degree.

3. There is a State Board-approved process Colleges use to plan and develop new programs. There is also a State Board policy on terminating low enrollment or inactive programs.

4. Curriculum programs are organized around system-wide standards and include ladder opportunities (i.e., certificate, to diploma, to degree) for students. This gives more students the opportunity to earn a credential and facilitates the transfer of students from one Community College to another.

5. College transfer or liberal arts programs have not negatively impacted the statutorily required emphasis on workforce education and training (technical and vocational) and adult education. For the last five years, college transfer enrollment has consistently been about 22% of total curriculum enrollment. Conversion from the quarter system to the semester system several years ago has not negatively impacted workforce education and training.

6. The basic skills offerings in the Community Colleges are structured so as to allow progression to the next level within the same institution (i.e., educational ladder).

7. The Community College System provides a significant amount of education and training for business and industry through its continuing education programs. In addition, most of the training for public safety agencies at the local level—fire, emergency rescue, and law enforcement—is provided by Community Colleges.

8. The BioNetwork initiative, the Community College System's component of North Carolina's focus on biotechnology, has been rapidly organized at the System level and among participating Colleges over the past year. Collaboration with UNC and particularly NCSU and NCCU is a key part of this initiative. This collaboration has great potential for both systems and could serve as a model for future initiatives.

9. The funding process for Community Colleges is enrollment driven and has a one-year lag. Special funding to start new programs is usually not provided. This will continue to have a negative impact on planning and implementing new programs, particularly high cost offerings that will be needed to support the education and training needs of emerging industries.

4B. UNIVERSITY OF NORTH CAROLINA

Overview of System

North Carolina's Constitution (1776) directed, in part, that "all useful learning shall be duly encouraged and promoted in one or more universities." In 1789 the General Assembly chartered the University of North Carolina. Until the late 1800s, the University at Chapel Hill was the only state-supported institution of higher education in North Carolina. Between 1867 and 1963, the other 15 institutions now in UNC were created or acquired.

In 1971, the Higher Education Reorganization Act restructured the public senior institutions in North Carolina. The 32-member Board of Governors (BOG) was established to govern all public senior institutions in the state and a student was designated to serve, ex officio, on the board. The BOG is the policy-making body legally charged with "the general determination, control, supervision, management, and governance of all affairs of the constituent institutions." It elects the President, who administers the University. The 32 voting members of the BOG are elected by the General Assembly for four-year terms.

Each of the 16 constituent institutions has a board of trustees. Each board has 13 members, with eight members being elected for four-year terms by the BOG and four being appointed for four-year terms by the Governor. The SGA president serves as an ex officio member.

UNC and its constituent campuses are considered to be agencies of the State of North Carolina. UNC funds come from state appropriations, tuition receipts, federal grants and contracts, and other non-state funding sources.

Current Academic Programs

The UNC provides accessible academic program information to prospective students and others. A program matrix is available from UNC, by program area, by institution, and by degree level (Referenced in Attachment 5 of this report as Appendix 4.B.1.).

In the case of UNC, there are approximately 31 different academic degree program areas and over 300 distinct degree programs; however, no UNC institution offers academic programs in all areas. For example, programs in agriculture are only offered by the state's two land grant institutions: North Carolina A&T and North Carolina State University. Also, a limited number of institutions offer high cost, relatively low demand engineering programs. For example, only North Carolina State University has a comprehensive engineering program (16 different majors, 12 of which include bachelors, masters, and doctoral programs). North Carolina A&T offers an extensive engineering program with 8 majors, 3 of which include bachelors, masters, and doctoral programs. UNC Charlotte offers 6 engineering majors, 2 of which include bachelors, masters, and doctoral programs. A number of other institutions either have niche programs or joint programs. For example, UNC Chapel Hill offers masters and doctorates in biomedical engineering (joint with North Carolina State University), material science, as well as in operations research. East Carolina University has a baccalaureate engineering program. Western Carolina University offers a bachelors in electrical engineering jointly with UNC Charlotte. UNC Asheville offers mechatronics jointly with North Carolina State University.

There are a number of program areas for which all institutions offer degrees (with the exception of North Carolina School of the Arts, which has a distinct and unique mission). These include: biology; accounting; business administration; computer science; English; mathematics; chemistry; psychology; history; political science; and sociology.

In areas of high demand such as teacher education, nursing, and computer science, UNC institutions offer a significant number of degrees at most, if not all, UNC institutions (with the exception of North Carolina School of the Arts). Education degrees are offered everywhere except North Carolina School of the Arts. Not all institutions offering teacher education do so in all fields or at all degree levels. Nursing is offered at eleven of the institutions, with masters programs at six of those institutions, and doctoral degrees at three. Computer science is offered at the bachelors level at all institutions, masters at eight institutions, and doctoral degrees at two.

In areas of relatively low demand, such as philosophy, physics, and classics, a number of UNC institutions provide access to degrees in those areas. Six institutions offer a bachelors in philosophy and only UNC Chapel Hill offers masters and doctoral degrees. In physics, twelve institutions offer a bachelors degree, six a masters, and two provide doctorates. And in classics, only three institutions offer a bachelors and only one (UNC Chapel Hill) also offers both the masters and doctorate.

In emerging fields, such as bioengineering and biomedical engineering, nanotechnology, and food safety, UNC has limited (one bachelors, two masters, and two doctorates in bioengineering and biomedical engineering) or no apparent programs (nanotechnology and food safety), although there may be such programs incorporated in other existing degrees and in research activities.

The liberal arts are well represented in the program offerings. (See separate section on the liberal arts on pages 103-106 of this report). All institutions offer a number of the key liberal arts majors (such as English and History) and most offer an extensive array of liberal arts majors. In addition, North Carolina has made a commitment to supporting a public liberal arts college, UNC Asheville, which has many of the characteristics of an elite private liberal arts college.

Remediation is extensive in NCCCS and, to a lesser extent, in UNC, responding to gaps in high school preparation and to the needs of adult learners who also have a time gap from their previous academic preparation. In UNC, each institution determines placement in remedial activities; these activities include not just remedial courses, but also skill labs, tutoring, and summer bridge programs (although not all of those students will enter remedial programs). Some UNC institutions contract with a local community college to provide remediation (East Carolina University with Pitt Community College and UNC Wilmington with Cape Fear Community College). Most of the remediation offered is in mathematics and English, with the greatest demand being for the former. Remedial courses count in a student's load but do not count towards a degree.

Enrollment in duplicated remedial instruction (that is, formal classes) in UNC institutions appears to have declined over an eleven-year period, from 9,043 in 1991-92 to 6,724 in 2002-03, a 26% reduction. The latest data suggest further reduction to 4,454 in 2003-04. A similar reduction has occurred in unduplicated enrollment, which appears to have declined 29% from 7,802 in 1991-92 to 5,516 in 2002-03. (Duplicated enrollment counts students twice if they need both math and English remediation; unduplicated counts such students only once.)

The overall percentage of freshman students in UNC institutions needing remediation is not reflected in the reports, which are not disaggregated by type of student (for example, new freshman, transfer, returning student). If all of the students needing remediation had been new freshmen (which they would not have been but that category makes up the majority of remedial students) then the percentages would have been 38.1% in 1991-92 and 20.7% in 2002-03. Of those needing remediation, 70.7% require remediation in math.

Remediation in NCCCS includes not just English and math, but also developmental reading. Community Colleges select from an approved list of placement tests and their policy calls for the adoption of a minimum test score to exempt a student from developmental studies courses. The need for remediation has increased from 33.2% of the students requiring one or more developmental courses in 1992-93 to 49.2% in 2003-04. As with UNC institutions, math is the area of greatest demand (39.8%), followed by English (26.4%), and then reading (18.9%). The need for math has more than doubled since 1992-93. Although these data raise serious questions about the readiness of students to engage successfully in higher education, a significant proportion of NCCCS students are adults returning to education after an extensive absence from academic study.

All UNC institutions offer continuing education programs, which range from general interest courses to targeted skills development. While not as extensive or as focused as the continuing education programs in the Community Colleges, the UNC continuing education programs play a key role in the lifelong learning opportunities for the people of North Carolina and in providing access to the University for people in the local community who are not necessarily seeking a degree.

UNC institutions also engage their communities in other ways, especially in the arena of applied policy research. For example, the Appalachian State University Energy Center rates how involvement with the broader community can lead to a policy support role for the University. The Energy Center was established as a program in the Appalachian Regional Development Institute about four years ago in response to the needs of a group of faculty from various disciplines who were all involved in research on alternative energy. Because of the expertise of two faculty members, the Center received a contract to assist the North Carolina Energy Policy Council and the State Energy Office with development of the State Energy Plan in 2001. That contract, and subsequent contracts for implementation, brought the Energy Center into contact with energy policy leaders, the business community and the economic development community, resulting in multiple opportunities for additional involvement with energy policy issues. One subsequent activity has resulted in formation of a fuel cell group consisting of large corporations, innovative small businesses, environmental organizations and others to encourage a focus on fuel cell research and development as an economic development engine for the state.

Partnerships with communities can provide universities not just direct links to regional economic development, but also to quality of life issues that increasingly, albeit indirectly, play a significant role in economic development. UNC is a strong supporter and leader in multidisciplinary policies and partnerships that address community engagement, cooperative ventures, and public service activities. UNC has nearly 250 multi-disciplinary centers and institutes that serve regional and state needs. Twenty of these are inter-institutional centers or institutes, drawing on the joint oversight and participation of two or more UNC campuses. "NCCC member campuses seek to involve students, faculty, and the entire campus in community service in order to fulfill higher education's most noble goals of educating citizens, preparing tomorrow's leaders, and contributing to the life of America's communities." (http://www.elon.edu/nccc).

Universities across North Carolina are establishing new and significant partnerships with community and regional partners. In 2004, the University of North Carolina at Pembroke entered into a university-community partnership as co-founder and collaborating partner in a public-private partnership organized and coordinated by the Center For Community Action. The *Jobs For the Future Project* has initiated extensive research, policy development, and economic development projects, including annual conference on Job Loss and Recovery in Rural America.

In addition to these general engagements with their communities, UNC institutions have targeted efforts to the small business community through the Small Business Technology Development Center (SBTDC) program. With eleven regional centers and seventeen offices, this program has a budget of approximately $5M and a staff of 80, with 350 graduate and professional students working with clients annually. The focus market segments are:

1. entrepreneurship development services for start-ups and young companies (up to three years old);
2. survival and growth support for traditional small businesses (less than $1 million in sales, over three years old);
3. growth and competitiveness strategies for small and mid-sized companies (more than $1 million in sales); and
4. support for communities and agencies to help them develop more effective economic development strategies and tools.

The program provides: in-depth business counseling to about 7,000 clients a year; management education services to approximately 6,000 attendees; strategic action training for nearly 1,000 owners and managers each year; and service to public agencies and organizations.

States with governing boards for their universities, like North Carolina, have the ability to manage the array of academic programs in the best interests of the state and to facilitate non-credit and other services to communities. With program approval authority, a governing board can insist on distinctive missions for its institutions and on no unnecessary academic program duplication. While at times the exercising of this authority can frustrate campus boosters, including legislators and Chancellors, if a fair and reasonable process is followed for program approval then the appropriate balance between institutional ambitions and state needs can be achieved. UNC includes external reviewers to provide an objective analysis of need in complex cases. (A recent example would be the engineering need study conducted by NCHEMS for the system.) This level of state overview probably helps explain why North Carolina has been able to prevent over-expansion of extremely expensive professional programs like medicine (East Carolina University and UNC Chapel Hill), law (North Carolina Central University and UNC Chapel Hill), and veterinary medicine (North Carolina State University).

PRELIMINARY FINDINGS - UNC

1. UNC makes its academic program array readily accessible to prospective students.

2. UNC institutions provide a wide range of academic offerings in all the major, traditional areas. These programs seem to be appropriately distributed across the institutions with relatively clear mission differentiation. For example, UNC includes a School for the Arts and a public liberal arts university (UNC Asheville).

3. UNC institutions all offer a broad range of liberal arts majors.

4. UNC should continue its processes to minimize unnecessary and expensive duplication of specialized academic programs.

5. UNC institutions offer extensive academic programs in areas of current high state need.

6. UNC appears to offer a reasonable number of low demand academic programs that are desirable for offering a full academic array in the state.

7. UNC institutions may not be offering identified academic programs in certain emerging fields as quickly as some other states, although such programs may indeed be imbedded in existing programs.

8.a. UNC should increase its efforts to expand cooperative degree programs and collaborative programs, both within UNC and NCCCS. These efforts would be accelerated by special incentive funding from the state.

b. UNC should work with the institutions to implement some modification to the program approval process to allow greater nimbleness in responding to new programs that respond to economic transformation initiatives, especially in emerging areas. Such a modification might include:

- Creating "incubator" degrees with fast-track approval for an initial period.
- Redesign of certain masters and Ph.D.'s in accelerated programs, including use of technology.

PRELIMINARY FINDINGS – REMEDIAL EDUCATION - UNC/NCCCS

9. While remedial education *appears* to have declined in the UNC, it is difficult to draw a definitive conclusion as each UNC institution sets its own placement standards. Also, some do not offer formal remediation instruction (UNC Asheville and UNC Charlotte offer skill labs; UNC Chapel Hill provides summer bridge programs.). As a consequence, remedial programs are not reflected in the enrollment data.

10. It is likely that a significant percentage of freshman students in UNC require formal remedial instruction (at least double digits and perhaps as high as one in five). When non-formal remedial activities are included, an even higher proportion of students require remediation. This adds to the cost of UNC and to the time to degree of such students. It also reduces their chances of being successful. It is unlikely that North Carolina can build a workforce for the knowledge economy without significantly decreasing the proportion of students who enter higher education requiring remediation instruction. Particularly disturbing is the proportion of students who require remediation in math since much of the knowledge economy, with its technology and science emphasis, requires strong math skills.

11. The trends for students requiring remediation in the NCCCS are disturbing. Since 1999-2000, the range of students needing remediation has been between 48.6% (2000-01) and 54.3% (2001-02) with no real pattern of decline.

12. Approximately half of the students in the NCCCS require formal remedial instruction. As with the UNC students, the highest proportion of NCCCS students require remediation in math. This is equally troubling because more and more community college programs require increased levels of skill and knowledge in technology and math.

PRELIMINARY FINDINGS – OTHER SERVICES - UNC

13. UNC institutions offer an extensive array of non-credit programs that include some activities to assist lifelong learning and career changes.

14. UNC has a robust Small Business Technology Development Center, dispersed throughout the state that provides services to small and medium businesses and provides a substantial return on investment for the state.

4C. JOINT PROGRAMS AND PARTNERSHIPS

Role of the Governing Boards

Both UNC and NCCCS have state-level governing boards. From a state-level perspective, this has facilitated the development of joint programs and of partnerships. In addition, over a decade ago the General Assembly created the Education Cabinet, which operates within the Governor's Office and includes the Governor, the Chair of the State Board of Education, the Superintendent of Public Instruction, the President of the North Carolina Community College System, the President of the University of North Carolina, and the President of the North Carolina Association of Independent Colleges and Universities. Annually, the three public education governing boards—public schools, community colleges, and public universities—meet to review policy issues and to share information about public education in North Carolina.

In 2004, the UNC Board of Governors and the State Board of Community Colleges appointed the Task Force on UNC/NCCCS Partnerships to make recommendations on partnerships between the public universities and the community colleges. Late in 2004, the Task Force submitted its report to the two governing boards with twenty-five recommendations, addressing annual reporting and communication, joint legislative action, academic programming partnerships, and transfer issues. The Board of Governors and the State Board of Community Colleges have presented to the 2005 General Assembly identical budget proposals to address five of the recommendations:

1. Place UNC counseling/advising services on each Community College campus: These transfer offices would provide information to prospective transfer students, advise these students, coordinate course/program offerings between the two systems, and serve as a proctored test center to support online learning. (Note: The 2005 General Assembly approved eight UNC staff positions, to be based in the Department of Public Instruction's Regional Alternative Licensure Centers across the state, to provide counseling and recruitment services for community college students and others seeking to enter the teaching profession, including lateral entry candidates for teaching jobs.)

2. Jointly establish the North Carolina Teacher Center Network: This network would serve prospective teachers and support area school districts by enhancing teacher quality initiatives. These centers would complement the transfer centers and be co-located on a smaller number of geographically distributed Community College campuses.

3. Further develop the 2+2 E-Learning initiative: This initiative would provide additional faculty support to develop courses. Emphasis will be on students being able to earn a BSN, or teaching certificate, or to advance from the RN to a BSN by distance learning from any county in North Carolina. The NCCCS Virtual Learning Community and more than 60 UNC baccalaureate completion programs can be combined to ensure that students anywhere in the state can have access to a degree program. (Note: The 2005 General Assembly appropriated $1 million for 2005-2006 to each system [recurring for NCCCS, non-recurring for UNC] to further develop this initiative.)

4. Expand the College Redirection Program: The College Foundation of North Carolina (CFNC) will expand its current program that matches not-yet-accepted students to colleges or universities with available space, so that community college students seeking to transfer are included. Students will be directed to the CFNC website and telephone number.

5. Expand the responsibilities of the Transfer Advisory Committee: The recently completed study of the Comprehensive Articulation Agreement between UNC and the NCCCS includes recommendations to expand the Committee's responsibilities. Permanent staffing is needed to do the work of the Transfer Advisory Committee, including revising the CAA document and developing a communications plan for the benefit of the institutions and students seeking transfer information.

SELECTED PARTNERSHIPS AND COLLABORATIVE INITIATIVES

The UNC Office of the President published a report in August 2004 listing the numerous partnerships now in place between Community Colleges and the UNC institutions. All UNC institutions listed ways they are working with Community Colleges. Selected examples from the extensive listing of UNC and NCCCS partnerships are briefly described below because of their uniqueness or their potential for replication.

Appalachian Learning Alliance

In 1999, Appalachian entered into a formal alliance with 10 Community Colleges in its traditional service region to deliver more advanced educational offerings than the respective Community Colleges were able to offer. The current program offerings are a mixture of both graduate programs and undergraduate degree completion programs. In the undergraduate programs, the Community Colleges typically offer much of the lower division course work consistent with the Comprehensive Articulation Agreement, and Appalachian offers upper division and other course work as needed to allow students to complete the degree. The principal delivery mode of most of these programs is face-to-face, but interactive video and web-based modes are sometimes used as parts of courses or programs. Appalachian delivered instruction at these sites as part of 27 graduate programs and 20 undergraduate programs during the Fall 2004 semester. Teacher preparation programs receive special emphasis in the Learning Alliance offerings.

East Carolina University's Wachovia Partnership East

With financial assistance from Wachovia Bank, the East Carolina University College of Education has established regional consortium partnerships with the Community Colleges and public schools. Five consortia partnerships have been formed and are designated by geographic proximity to ECU—Pitt Consortium, Coastal Consortium, Northeast Consortium, South Central Consortium, and North Central Consortium. Each consortium serves the Community Colleges and school systems in that region. Students are able to complete the first two years of a baccalaureate degree at their community college (associate degree), using faculty from the Community College. After completing the associate degree, students move to the hub Community College in that region for the remainder of the course work for the baccalaureate degree. The upper level courses are taught by ECU faculty, either face-to-face or by distance learning. Each hub site has a full-time coordinator that serves as a resource to students and the local partners (community colleges and school systems).

Elizabeth City State University's Teacher Preparation Partnership Program

Elizabeth City State University (ECSU) and College of The Albemarle (COA) have an articulation agreement that focuses on the preparation of elementary school teachers. Students who participate in the program are provided a set of coursework and services offered through the two institutions. The first two years are offered by COA on their Elizabeth City campus and the second two years on the ECSU campus. Students in Dare

County attend COA's Dare County Campus and ECSU also offers its courses on that campus. ECSU has committed to a full-time liaison to coordinate this program on COA's campuses.

ECSU has implemented a similar partnership with Halifax Community College (HCC), located a two-hour drive to the west of Elizabeth City. ECSU and HCC have an articulation agreement allowing students to pursue an elementary education degree. The University offers its courses on the Community College campus and provides a full-time liaison for on-site coordination.

North Carolina State University's Biomanufacturing Training and Education Center and BioNetwork

The North Carolina Biomanufacturing Training and Education Center (BTEC) is a new initiative funded by the Golden L.E.A.F. Foundation and by the North Carolina legislature to provide in-depth, hands-on training and education for students and prospective employees of the biomanufacturing, pharmaceutical, and related regulatory industries in North Carolina. Much of the training and education will focus on the unique skills needed that are not typically covered in traditional college and university curricula: hands-on experience on large-scale reactors and downstream processing equipment, clean-room training, aseptic processing, regulatory issues, validation, quality assurance and control, scale-up engineering, and related technologies. The Center will also provide education in emerging knowledge areas that will centrally impact the future of applied biotechnology, including advanced expression platforms, molecular discovery, and systems biology. The hands-on training will involve a close partnership with the North Carolina Community College System in which Community College and University instructors, lecturers, and professors will work side by side developing courses and curricula and by teaching jointly. Community Colleges will have designated space in the BTEC to offer capstone education and training for Community College students in biotechnology-related programs. This facility is projected to be occupied in late 2006.

NCSU, through the Cooperative Extension Service, Johnston Community College, and others, worked on a proposal that led to the funding and construction of the Johnston County Biotechnology Training Center. This collaborative initiative will focus on bio-pharmaceutical education and training.

University of North Carolina Charlotte's Transfer Initiatives

UNC Charlotte has the largest transfer student population of all UNC institutions. Fifteen percent (871 of 5,365) of all Community College transfers to UNC institutions in Fall 2003 went to UNCC. UNCC has a long history of closely working with Central Piedmont Community College and other Community Colleges in the region, including conducting workshops and frequent visits to Community College campuses by counselors and recruiters.

Western Carolina University

Western Carolina University has numerous collaborative arrangements with Community Colleges in western North Carolina. These include the following:

- Articulation agreements with eight Community Colleges that allow the transfer of AAS graduates into several baccalaureate programs in the School of Applied Sciences.
- BSN and MSN programs that are held on the Enka campus of Asheville-Buncombe Technical Community College.
- Baccalaureate EMS program delivered by distance learning at several Community College campuses. Cohorts of students meet once each month, with the remainder of class sessions being offered online.
- Teacher preparation program at Tri-County Community College.

PRELIMINARY FINDINGS

1. Both UNC and the Community College System have state-level governing boards. They have shown a strong interest in developing partnerships and collaborative initiatives that lead to improved educational opportunities for students.

2. The two governing boards in late 2004 accepted the recommendations of the Task Force on UNC/NCCCS Partnerships and have started implementing the recommendations.

3. UNC and NCCCS should continue to submit joint budget requests to the General Assembly; priority should be given to funding recommendations emerging from the HB1264 study.

4. UNC and NCCCS should jointly produce an annual report to the General Assembly, their respective boards, and the general public. This report should be developed using a template for such partnerships to insure consistency of information. It should also identify those partnerships that have the capacity to be replicated.

5. Many collaborative activities between UNC institutions and the Community Colleges are quietly going on behind the scenes. However, many of them have great potential for students in both systems. One example is the development of 2 + 2 online collaborative programs in selected disciplines or majors. Students will be able to take the first two years online from a Community College and the upper division work online from a UNC institution.

4D. ENROLLMENT PROJECTIONS

Both the NCCCS and UNC maintain enrollment projections. In the case of NCCCS, those projections are at the system aggregate level, not by individual campus, and include data on Curriculum (regular credit programs), Continuing Education, Basic Skills, and Summer Term enrollments. The current projections go out through the 2013-2014 academic year. (Referenced in Attachment 5 of this report as Appendix 4.D.1) In the instance of UNC, those projections are by campus, disaggregated by undergraduate and graduate, and totaled for the system; the projections are headcount credit seeking students for each fall semester. The current projections go out through fall 2012 and will shortly be updated through fall 2015. (Referenced in Attachment 5 of this report as Appendix 4.D.2)

NCCCS uses some basic assumptions (See footnotes to Appendix 4.D.1 referenced in the previous section) and examines five year rolling averages in making its projections. UNC has been examining multiple models, looking at high school graduation rate projections (for undergraduate projections) and census data (for graduate projections). It also plans to look at projected high school graduates by race and ethnicity by county.

The enrollment projections for NCCCS show an overall increase of 38.37% between 2004 and 2014. Greatest percentage growth is predicted in the Continuing Education enrollment at 44.20% (from 20,831 to 30,037), followed by Basic Skills at 43.25% (from 17,808 to 25,511), Summer Term at 40.32% (from 18,730 to 26,282). The lowest predicted growth comes from the Curriculum area at 36.64% (from 142,056 to 194,104 FTEs). The annual growth in every area is largely incremental (ranging from 2.32% to 4.18%), with no area showing a decline in any year.

The enrollment targets for UNC show an overall increase of 32.89% between 2002-2012 (the current ten-year plan period), increasing from a total of 176,967 students in 2002 to a projected 235,180 students in 2012. The increase in graduate students is projected at 43.38% (from 36,635 to 52,528), significantly higher than the projected increase for undergraduates at 30.16% (from 140,331 to 182,652).

Enrollment projections (as opposed to enrollment caps) are somewhat unreliable, especially in the further out years. They rely on predicting human behavior without full knowledge of a multitude of variables. For example, the economy often influences higher education enrollment, especially at Community Colleges. (For example, during economic downturns enrollment pressures increase as people seek to improve their marketability.) Also, policy decisions such as admission standards and tuition rates can impact enrollments. National and international events can further impact enrollments. (For example, a decline in foreign student enrollment because of greater difficulty in getting student visas; or the relative attractiveness of a military career as an alternative to college.) Nevertheless, even though enrollment projecting is an inexact science, it is a worthwhile and necessary part of higher education and state planning.

PRELIMINARY FINDINGS

1. Both the NCCCS and UNC maintain ten-year enrollment projections. However, the NCCCS does not disaggregate its data by institution, although it does incorporate all elements of its instruction (not just the credit producing programs); the absence of individual campus projections may inhibit regional planning for workforce production. While the UNC does disaggregate by institution, it does not provide projections for continuing education.

2. While both systems project significant enrollment increases, the current models do not anticipate major shifts in current enrollment patterns (for example, major changes in age cohorts participating in higher education; significant changes in retention rates). The UNC models could be easily adapted to examine these changes at the appropriate time and do examine such items as changing demographics by county.

3. The increase in the projected graduate student enrollment has positive implications for the new economy, which will require a more highly educated workforce.

4E. DISTANCE LEARNING

Overview

Distance learning has a long history in American higher education beginning with correspondence courses. Now the Internet has provided new tools to bring e-learning to students at any time and at any place. This mode of instruction is of particular benefit to place bound students and students already in the workforce. This demand for e-learning will inevitably increase in importance as a greater proportion of the population seeks to increase education levels. In analyzing distance education, it is important to look at issues such as:

- Enrollment and Academic Data
- The Percentage of Faculty Participation In Distance Learning
- Organizational Responsibility for Distance Learning
- Distance Learning Modes
- Content Sources
- Support
- Software Platforms
- Evaluation

It is also critical to examine such infrastructure issues as bandwidth capacity and the reliability/flexibility of the present systems to insure the infrastructure is robust enough to support the increasing demands for this type of instruction.

Meaning and Comparability of Data

UNC distance learning data are presented for distance education instruction funded by the UNC enrollment funding model[84] and for degree programs rather than individual "stand alone" courses in distance education.

Due to the mode of state funding, UNC defines distance learning according to place of delivery, not technology. Therefore, courses delivered via any method off-campus, including site based courses that may or may not use online elements, are noted as distance learning courses. As of Fall 2005, the aggregated breakdown of distance learning degree programs is as follows:

Mode of Instruction	Number
On-line (Internet)	82
Mixed Synchronous (Blended mix of online, two-way video, face-to-face that requires "same time" involvement)	23
2-Way Video	3
Mixed Asynchronous (Online plus other asynchronous modes such as cd-rom or videocassette)	5
Site Based Delivery (Face-to-face at one location; UNC reports that most have some online elements)	219

These degree programs offered over 4,000 distance courses in 2005.

UNC is able to identify whether a course's primary mode of instruction is online asynchronous. However, it does not track the use of technology in standard resident courses, though most courses have some technology elements. In this regard, there is an increasing number of resident students who take distance/online courses.

NCCCS defines distance learning in terms of technology (Web-based courses, tele-courses, two-way video, other), not class location. The significant amount of teaching NCCCS does off-campus at high schools, dedicated centers, etc., that is taught "face-to-face" is not, by their definition, distance learning.

NCCCS data are for curriculum courses only and do not include continuing education. They do track distance learning for hybrid courses. NCCCS defines a hybrid course as a traditional course modified through reduction of the number of face-to-face contact hours and augmented with online learning components.

[84] The figures are somewhat higher when "non-fundable" enrollments are included; e.g. such as university employees who take courses for free, senior citizens who take courses tuition free, as well as some courses that are contracted at special fee rates.

Issues with respect to the meaning and comparability of data for UNC and NCCCS will be addressed in our final report.

4.E.1A. DISTANCE LEARNING DATA: UNIVERSITY OF NORTH CAROLINA

Enrollment and Academic Data

There has been substantial growth in distance learning in UNC: in course sections (from 646 in Fall 1999 to 1,908 in Fall 2004); headcount enrollment (from 6,929 in 1999 to 33,139 in 2005); and in student credit hours (from 38,998 in 1999FY to 228,104 in 2005FY). The graphs on the following pages summarize key enrollment and academic data.

Figure 1: Growth in UNC Distance Learning Course Sections: Fall 1999—Fall 2004

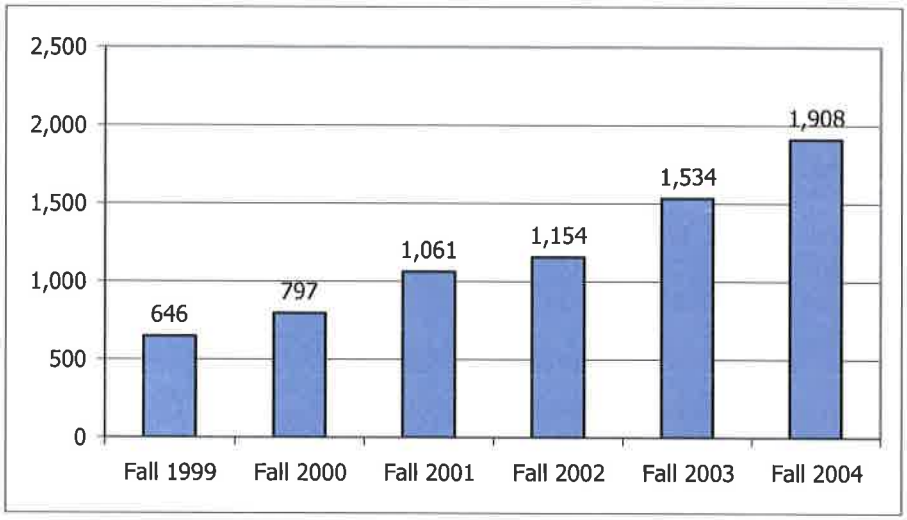


Figure 2: Growth in Unduplicated Headcount Enrollment in UNC Distance Learning Programs, FY 1999 – FY 2005

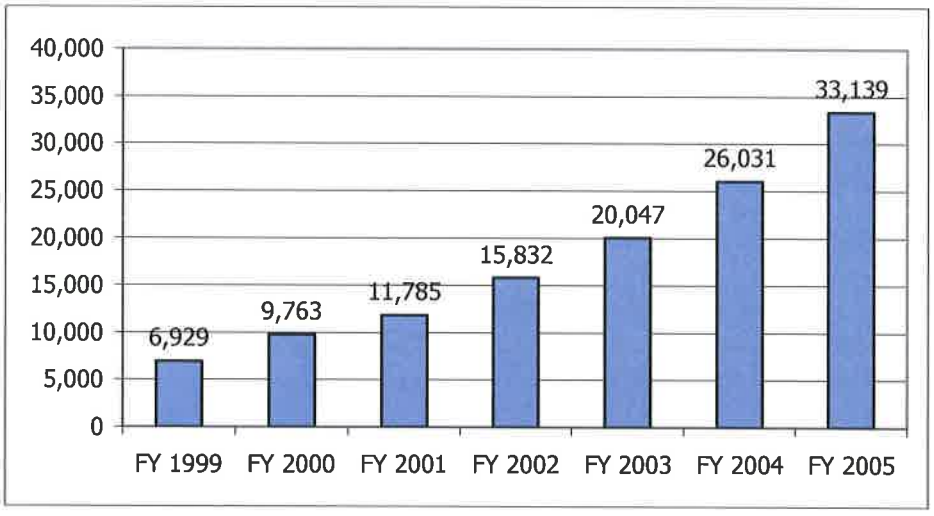
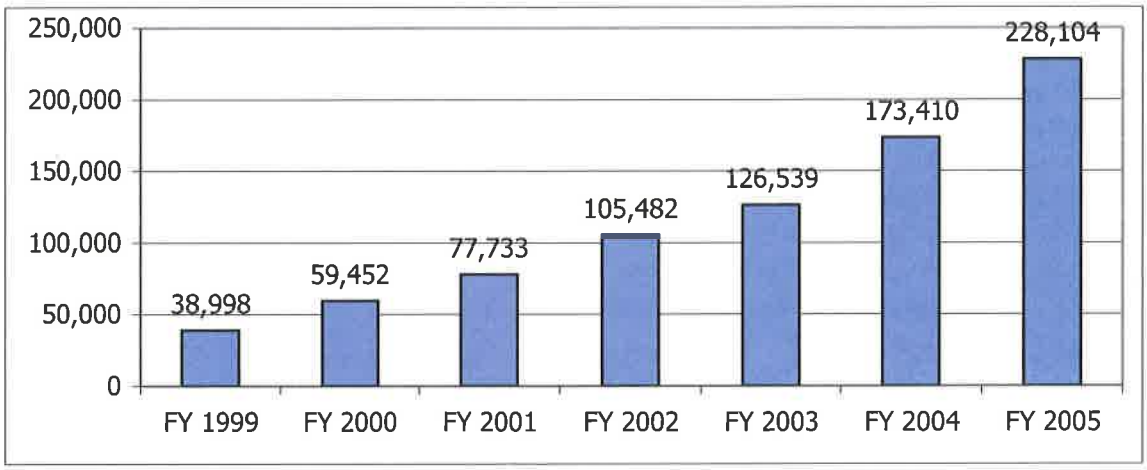


Figure 3: Growth in Student Credit Hours in UNC Distance Learning Programs, FY 1999 – FY 2005



Thirteen UNC institutions offer distance degree programs, two currently offer only courses (Elizabeth City State University and UNC Asheville), and North Carolina School of the Arts does not offer distance programs. Through an agreement with the North Carolina Community College System, UNC institutions do not offer lower division (100-200 level courses) in distance programs.

In spring 2005, UNC had 234 authorized distance learning programs in 83 CIP (Classification of Instructional Programs) disciplinary areas. Degree levels of these programs are: 97 baccalaureate; 118 masters; 15 intermediate (for example, EdS); 3 doctoral; and 1 first professional. Of these, 160 are site-based (compared to 131 in spring 2002), including 11 that are at more than one site. A total of 118 UNC degree programs are taught at 28 Community Colleges, with the remaining site-based programs taught at locations such as public schools, health care settings, military bases, and graduate centers.

Growth has been steeper in online degree programs (from 6 in Spring 2000 to 82 in Spring 2005), including a number of site-based programs that have been converted to online delivery. Development of online degree programs and inter-institutional collaborations has been encouraged by annual e-learning grants made by the UNC President's Office.

The percentage of faculty participation in distance learning varies greatly from campus to campus. Six campuses report participation rates between 10%-16%, and four campuses report participation rates below 10%. Six campuses did not include rates in their reports, while East Carolina University placed the rate at 10%, adding that all courses include e-learning content.

Organizational responsibility for distance learning differs greatly from campus to campus. In general, distance learning is overseen by the Vice Presidents for academic affairs. Some campuses place distance learning with continuing education; some place it under the auspices of individual departments; and some have established departments specifically devoted to teaching technologies. At the System level, academic program development and approval for the offering of distance learning programs rest in Academic Planning within Academic Affairs in the Office of the President. Four vice presidents (academic affairs, academic planning, information resources, and finance) share responsibilities for distance learning. Since the issues range from program approval, electronic infrastructure, tuition and fees, and cooperative programs, it is necessary for wide involvement in the management of the University-wide issues that arise with distance and online learning.

Distance Learning Modes: All but one of the 16 campuses offers asynchronous learning via Blackboard or WebCT. Very few courses use simultaneous live/online content.

Content Sources: Of the campuses responding, all but Elizabeth City State University devote on-campus development resources to distance learning, although five do so only at the departmental level. The number of full-time employees devoted to course development varies greatly from campus to campus, from none at UNC Asheville to 27 at East Carolina University. Similar to the percentage of faculty participation rates, there are plateaus of FTE between these extremes, with four institutions devoting 2-7 FTEs, and three devoting 14-18 FTEs to learning technology development. The use of outsourced or third party content also varies, with about 30% of campuses using this type of resource.

Support: All campuses use online, phone, email and face-to-face support for faculty and students. Some include outsourced help desk, online manuals or self-proficiency courses.

Across the 15 campuses offering distance education, the number of FTEs per campus working in the area of distance learning technical support ranges from 1.0 to 9.0. The number of distance learning faculty members providing technical support averages approximately twenty per campus. The number of FTEs working in the area of distance learning technical support has doubled or tripled on most campuses over the past five years.

Pedagogical support: All campuses offer faculty a modest amount of pedagogical support, either in the form of instructional design personnel or workshops and other forms of professional development opportunities in the area of online instructional design. In addition, all professional development activities of the UNC Teaching and Learning with Technology Collaborative are available to all campus faculty and staff members.

Software platforms for learning management and course delivery: Ten campuses use *Blackboard*, and six use *WebCT*. Individual faculty also utilize *MS FrontPage, Centra, Netmeeting, Edufolio, Wimba, Impatica, Camtasia, WolfWare*, and others. There is no overall learning content management system, but pilot projects using Blackboard and WebCT are underway. Four campuses outsource their content hosting. Purchasing standards for distance learning technology are currently shared among campuses, with development ongoing throughout UNC. With the announcement that Blackboard and

WebCT will merge, UNC will have substantially a single course management system for distance learning.

Collaboration: As part of the 1999 UNC Information Technology Strategic Project, the UNC Office of the President formed three new offices within the Division of Information Resources: the Office of Coordinated Technology Management; the Shared Services Alliance; and the Teaching and Learning with Technology Collaborative:

- Coordinated Technology Management identifies common IT products and services used by UNC campuses and negotiates group acquisitions and system-wide contracts to contain costs.
- The Shared Services Alliance ("Alliance") provides a forum for UNC's 16 campuses to explore new and better ways to collaborate on administrative IT issues. The Alliance spearheads a number of projects to bring new applications to UNC's campuses.
- The Teaching and Learning with Technology Collaborative (TLTC) provides faculty and staff development opportunities, vision, and shared resources in support of teaching and learning with technology programs and initiatives on the 16 UNC campuses. The TLTC supports campus distance learning initiatives, as well as all campus efforts to promote technology-enhanced instruction.

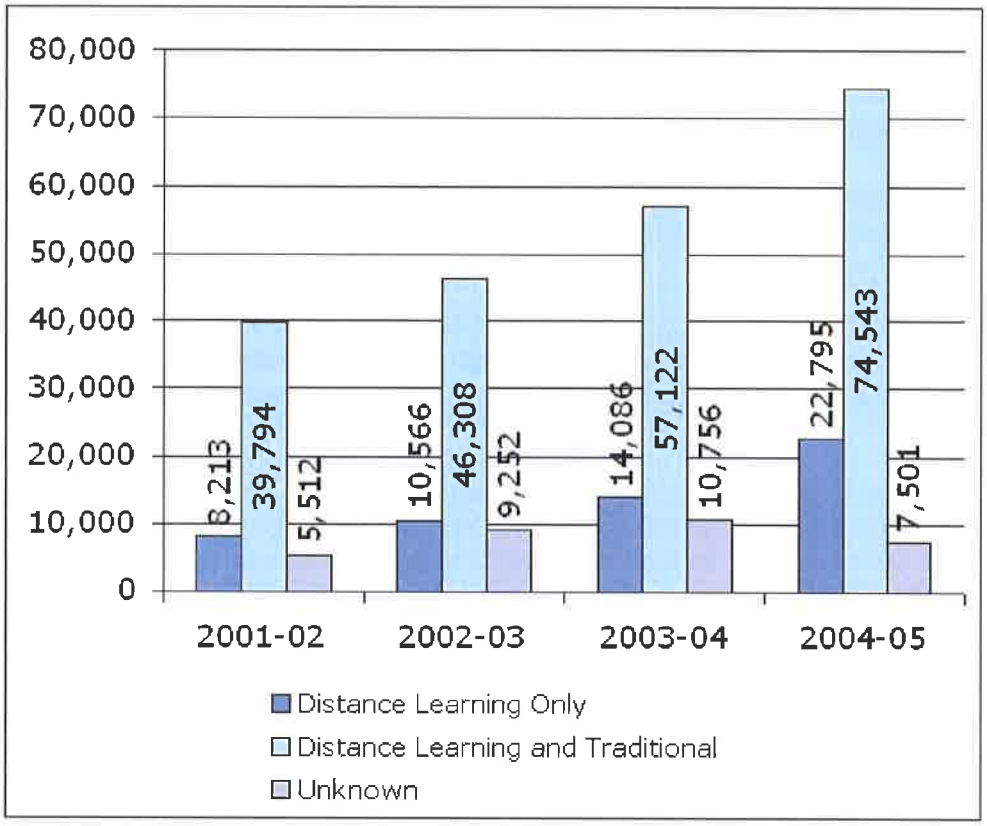
Evaluation: Online learning is evaluated differently on each campus, but most conduct surveys of students and/or faculty regularly. Faculty are often asked to review the quality of material being taught, while the students are more often asked to review the quality of the delivery methods.

In general, the evaluation processes for course and instructor quality used on campus are also used for distance programs. Program assessment is typically done on a course-by-course basis. Some approaches to ensuring quality include: student surveys on quality of course and instructor; analysis of student performance and demographic data; surveys of satisfaction with services such as registration and library access; peer evaluation of teaching; program advisory councils; use of evaluation specialists; and feedback from employers and internships. (*Ref: Report on Expanding Access Through State-Funded Distance Education Program, page 12.)*

4.E.1B. DISTANCE LEARNING DATA: NORTH CAROLINA COMMUNITY COLLEGE SYSTEM

Distance learning enrollment has also grown rapidly in the NCCCS, from 8,213 unduplicated headcount enrollment (distance learning only) in 2001-2002 to 22,795 in 2004-2005. Unduplicated enrollment shows about the same three-fold increase over this four-year period (from 82,823 to 238,697).

Figure 4: Curriculum Unduplicated Headcount by Course Method of Instruction (Distance Learning Only and Hybrid) - The North Carolina Community College System



The percentage of faculty participation in distance learning:
No data available.

Organizational Responsibility for Distance Learning: In 2003, two Associate Vice President (AVP) positions were created to support distance learning at the system level. One is charged with distance learning content, and the other is responsible for infrastructure and support. Both do not work solely with distance learning. One AVP is assisted by two staff (one part-time, one full-time), and the other has five (four in Library Resources and one in Video Services). The two AVPs and staff collaborated to develop the NCCCS Distance Learning Strategic Plan and NCCCS Distance Learning Expansion Budget Request for '05-'06 & '06-'07 budget planning cycle.

Distance learning administration and organization varies among NCCCS institutions. Rapid growth of online delivery has often resulted in the creation of distance learning departments. Among the 58 institutions, there is one AVP Distance Learning position, several Deans with multiple responsibilities, and many Distance Learning Directors or Coordinators.

Distance learning modes: Asynchronous delivery systems include: *Blackboard, Ucompass/Educator, Campus Cruiser, Ed2go, Moodle* (open source; one college).

Nearly all online course and telecourse enrollments across the NCCCS are "Pure Distance Learning" requiring no on-campus/in-person instruction for the student. If mandatory meetings are required with face-to-face options, those courses are designated as hybrid or "other" as a distance learning format.

Content Sources

On Campus Faculty or Resources: To date, faculty development teams have centrally developed 203 curriculum and 12 continuing education courses for use by colleges throughout the state. However, this is only about 15% of the courses that have been developed or procured. Of the other 85% of courses, NCCCS estimates 5% to 10% are "course cartridges," or commercially produced content procured from various sources, and the balance have been developed by faculty.

NC-NET: NC-NET offers Community College faculty in North Carolina a collaborative, statewide professional development system that is committed to sharing best practices, leveraging resources, and avoiding duplication. There are no positions dedicated solely to the production of course content. Many Colleges produce their own courses, but production is completed by local faculty members. One College outsources hosting for its *Blackboard* installation, two Colleges share support for *CMS* installations, and five Colleges are negotiating *Blackboard ASP hosting services.* The System Office is negotiating ITS hosting of *Blackboard Learning System Enterprise version*; *Campus cruiser* is used in some colleges; and *Ed2Go* provides Occupational and Continuing Education for all colleges.

Purchased From 3rd Party: NCCCS currently purchases online content from two vendors, while some Colleges use online content from book publishers.

Support

No system-wide distance learning support is available due to funding limitations, and local support varies according to available resources. Most Colleges have telephone and email support, while two provide *Presidium Learning* online help desk services.

Software Platforms

Learning Management: Currently, *Blackboard, Ucompass/Educator, Campus Cruiser, Ed2Go, Moodle* (open source; one college).

Course delivery: CMS software (*Blackboard, WebCT, Educator*) is used to support hybrid courses and provide course enhancements. The *Blackboard* CMS platform has been established as a standard. Outsourcing and/or hosting services are utilized in isolated instances.

Evaluation

No hard data are available regarding distance learning effectiveness. However, there is anecdotal evidence that distance learning retention rates have been rising for the past five years and approximate those of traditional courses. Each College assesses the effectiveness of each course. A superset of distance learning course assessments does not exist.

It is the intention of NCCCS per Objective 5.1 in the *Strategic Plan for Distance Learning* to recruit a team of distance delivery experts to audit the process for creating Web-based courses.

4.E.2. INFRASTRUCTURE: UNC AND NCCCS

Distance learning plays a prominent and increasing role at both UNC and NCCCS. It represents a cost effective and potentially high quality method for providing instruction to the existing student base, as well as dramatically extending the reach of the UNC and NCCCS student base. If growth at UNC and NCCCS continues at the current pace, the need for adequate technical infrastructure (bandwidth, related communications technologies, and support) is critical.

A baseline review was undertaken of the University of North Carolina (UNC) and Community College (NCCCS) distance learning infrastructure in relation to their capacity, future utilization, and preparedness for anticipated growth.

UNC TV, an affiliate of UNC, which serves both the community colleges and the university, has converted to digital and will have a data channel that can move massive amounts of data. Work is just beginning to determine the use of this resource in distance and online learning.

Bandwidth Capacity

UNC

UNC's bandwidth comes from the North Carolina Research and Education Network (NCREN). NCREN is a charter member of Quilt, the national association of GigaPoPs. This membership enables NCREN to procure, on behalf of all connected institutions, the very lowest possible Internet and Internet2 rates. NCREN's charter allows the connection of all of Higher Education: UNC Universities; Community Colleges; K-12 Public and private schools; state, local, and county government offices; research organizations; other non-profit organizations; and a small number of related commercial organizations.

- While UNC has considerable bandwidth, the demands are likely to continue to grow because of the anticipated increase in older students (partly as a result of demographics), the increase in part-time students, and the increase in courses with greater bandwidth requirements (such as health related courses and graduate programs).

NCCCS

T-1 data connectivity is provided to all Community Colleges, and is directly funded by the System Office through its ITS department. Colleges can elect to augment ITS bandwidth with local funding, or Colleges can contract with local Internet Service Providers. Some Community Colleges (for example, Guilford Technical Community College, Fayetteville Technical Community College, Pitt Community College) are buying more affordable bandwidth, which is a short-term solution.

There is clearly a constraint on bandwidth, and informal reports state that NCCCS is at 95% of capacity during peak usage periods. NCCCS (Ref. *NCCCS Requests For Distance Learning IT Funding Proposal Project Justification*) reports that ITS data service has not been uniformly increased in 4 years, but that typical data utilization of an organization increases 20 to 25% annually—even without introducing new bandwidth-intensive applications.

As student enrollment levels increase, peak periods will become even more of a concern, and cause more systems to drop under stress. Efforts such as the CCLINC Consortium requests for server upgrade and data base maintenance funding (Ref. *NCCCS Requests For Distance Learning IT Funding Proposal Project Justification*) are steps in the right direction.

For several years, the NCCCS and UNC have pursued an emerging wireless broadband technology called Educational Broadband Service (EBS), formerly ITFS. About half the community colleges and some of the universities hold licenses for bandwidths regulated by the Federal Communications Commission. This is still an emerging technology, but it has significant potential for the institutions serving rural North Carolina.

The future will put even greater demands on bandwidth. These include, for example:

- Implementing programs like the BioNetwork initiative will overstretch the 3MB service now in place in many of the Community Colleges (Ref. *2005-7 Expansion Budget Request Justification,* page 1, para 4).
- Adding bandwidth intensive applications, such as *Campus Cruiser*, Video Streaming, e-procurement, H.323 video services, voice over IP, Allied health applications and other similar technology (Ref. *2005-7 Expansion Budget Request Justification*, page 1, para 2.)
- Contemplating other technology initiatives such as:
  - ✓ The North Carolina Virtual High School that will provide a progression path from high school to Community College to university.
  - ✓ A learning content management system for system-wide management of all course materials. This initiative, when funded, could also help with consolidating programs and achieving system-wide cost efficiencies.

The following issues could also impact the need for increased bandwidth by UNC and NCCCS:

- Increasing the scope, depth and "media richness" of courses.

- Developing WiMax (wide area wireless).

Reliability and Flexibility of Present Systems (UNC/NCCCS)

- Both systems are currently using Video Streaming, H.323 video services and voice over IP. These are accepted current technical standards that are designed to ensure both reliability and flexibility of systems. For example, H.323 allows video over IP, the Internet standard protocol.

- UNC utilizes video networking that includes automatic conversion gateways, 6 ISDN-B channels and various downlinks. All of these systems add reliability and flexibility of both capacity movement and course content.

- For NCCCS, the Data and NCIH Consolidation Project will upgrade the videoconferencing network to the current H.323 industry standard, allow expansion of video services to all main campuses, facilitate the expansion of data infrastructure at each College, and move all budget management to the System Office.

PRELIMINARY FINDINGS

1. The number of programs and courses offered through distance learning is growing rapidly for the NCCCS and UNC.
2. Student enrollment in distance learning programs and courses are growing rapidly for both UNC and the NCCCS.
3. Both UNC and the NCCCS appear to offer a greater percentage of courses through distance learning than the national averages.
4. The level of involvement in distance learning activities varies widely with each University or Community College.
5. The scope of support, and the facilities and personnel provided for content development vary considerably with each institution.
6. The demands on UNC and the NCCCS networking infrastructure continue to grow, due to increased numbers of course offerings and student enrollments, as well as the offering of more technologically demanding content presentations.
7. The present NCCCS network is near capacity for the distance learning offerings currently supported, creating a growing hurdle for expanding the scope or quantity of distance learning courses as well as planning future joint initiatives with the UNC.

4F. STUDENT MOBILITY

Comprehensive Articulation Agreement (CAA)

In 1995 legislative action led UNC and the NCCCS to develop the Comprehensive Articulation Agreement (CAA) in 1997. The (CAA) was designed to benefit students by improving the transfer of Community College students to UNC institutions, especially for those enrolled in the Associate in Arts or the Associate in Science degree programs. The CAA does not guarantee admission to a particular campus; however, some campuses have worked with specific Community Colleges to establish independent agreements to ensure that students who meet specific requirements will be accepted into a specific UNC institution.

Intensive work was done in 1996 by University and Community College faculty to identify courses appropriate for the general education core. Working with the Transfer Advisory Committee, a list of courses that constitutes the general education core was selected. If completed successfully by a Community College student, the core is portable and transferable as a block across all 58 Community Colleges and to all UNC institutions. Furthermore, the CAA enables North Carolina Community College graduates of Associate in Arts and Associate in Science degree programs who are admitted to constituent UNC institutions to transfer with junior status. The UNC Office of the President web site has an excellent online resource for those interested in more detail on the CAA, including information on private colleges and universities that honor the CAA (www.ga.unc.edu/student_info/caa). Referenced in Attachment 5 of this report, Appendix 4.F.1 gives the Comprehensive Articulation Agreement.

Due to the reduced number of general education hours in the Associate in Fine Arts degree program (28 SHC), the CAA treats these students differently. The receiving institution determines whether the courses with a "C" or better grade count as general education, major, or elective credit. AFA students who transfer must meet the general education requirements of the receiving institution.

The UNC Board of Governors and the State Board of Community Colleges recently approved the Transfer Assurance Program, which assures a community college graduate with either an associate in arts degree or an associate in sciences degree admission at a UNC institution. If the student cannot be admitted to the institution of his or her first choice, admission is assured at some other UNC institution.

Articulation Agreements for the Associate in Applied Science Degree

A majority of Community College programs lead to an Associate in Applied Science degree (AAS). A number of students who take the AAS degree, which is designed primarily for movement directly into the workplace, decide they would like to pursue a bachelors degree. For many years, some of the UNC institutions have worked with individual Community Colleges on bilateral articulation agreements for specific AAS programs.

The Comprehensive Articulation Agreement includes a section on the Associate in Applied Science degree. It states that upon admission to another public two-year institution or to a public university, a Community College student who was enrolled in an AAS degree program and who satisfactorily completed with a grade of "C" or better all courses that are designated for College transfer (general education, elective, or pre-major) will receive credit for those particular courses.

Articulation of AAS degree programs is handled on a bilateral articulation agreement basis rather than on a statewide basis. Under bilateral agreements, individual Universities and one or more Community Colleges may join in a collaborative effort to facilitate the transfer of students from AAS degree programs to baccalaureate degree programs. The Transfer Advisory Committee maintains a current inventory of bilateral articulation agreements for AAS degree programs.

Articulation of Selected Programs Using Distance Learning

The UNC and the NCCCS are developing articulated NCCCS online degree programs with selected UNC online baccalaureate programs with the objective of creating programs that can be completed in their entirety through distance learning. Faculty from the two systems have met and approved the curriculum for four programs—communication, liberal studies, criminal justice, and business administration. Information and computer technology is also being considered. In some cases, these programs will involve Associate in Applied Science degrees at the Community Colleges. For these, new tracks have to be developed so they will fall under the guidelines of the Comprehensive Articulation Agreement.

In March 2004, the North Carolina Joint Legislative Education Oversight Committee of the General Assembly contracted with MGT of America, Inc., to conduct a study of the Comprehensive Articulation Agreement (CAA) between the University of North Carolina (UNC) and the North Carolina Community College System (NCCCS). Completed in late 2004, this study's findings and recommendations were presented to the legislative committee and to the two governing boards.

By most accounts, the CAA, though not perfect, has been successful. The 2004 study by MGT of America confirmed that seven years after its implementation, the CAA has improved the transfer of students from Community Colleges to UNC institutions. The transfer process has been standardized, and students are better able to plan their movement to the public universities. This study revealed that most students expressed satisfaction with their transfer experiences and the advisement they received. However, advisors, administrators, and faculty described problems with the process and provided numerous suggestions for improving the process and the CAA. As a result, the study made 20 recommendations to the General Assembly and the two governing boards. These are in various stages of being implemented by the two systems, either independently or in collaboration.

The MGT study analyzed transfer information over a six-year period from 1997-98 through 2002-03. The analysis noted the following:

- Most measures of student performance showed an increase over the six-year time period. In many instances, significant shifts occurred after the 1998-99 year, suggesting that the changes were a result of the Comprehensive Articulation Agreement.
- Retention, graduation, and persistence rates for students entering UNC institutions with an associate degree compared to those without the associate degree demonstrated the advantage of completing the associate degree at a Community College prior to transferring to a UNC institution.

Table 1 on the next page shows total Community College transfers to UNC institutions for Fall 2001-Fall 2004. These data include all Community College transfers, including those who transferred without an associate degree. Over these four years, total Community College transfers increased 27.1%.

Table 1: New Undergraduate Transfer Students from NCCCS

INSTITUTION	Fall 2001 Transfers	Fall 2002 Transfers	Fall 2003 Transfers	Fall 2004 Transfers
ASU	404	389	394	489
ECU	590	661	770	838
ECSU	72	95	76	107
FSU	160	175	207	208
NCA&T	151	198	194	182
NCCU	119	145	153	160
NCSA	8	10	11	6
NCSU	403	439	463	422
UNC-A	145	169	113	110
UNC-CH	146	124	180	208
UNC-C	751	812	871	878
UNC-G	469	471	467	513
UNC-P	234	284	286	318
UNC-W	527	579	711	764
WCU	265	259	307	358
WSSU	121	192	162	242
UNC Total	4,565	5,002	5,365	5,803

Table 2 below shows Community College transfers with associate degrees to UNC institutions for the same time period, Fall 2001-Fall 2004. Though there was a decrease in total transfers for Fall 2003, this number increased to slightly above prior years for Fall 2004.

Table 2: Transfer Students from NCCCS with Associate Degrees

INSTITUTION	Fall 2001 Transfers	Fall 2002 Transfers	Fall 2003 Transfers	Fall 2004 Transfers
ASU	167	178	137	196
ECU	232	219	237	244
ECSU	29	38	29	33
FSU	62	83	67	68
NCA&T	55	38	20	39
NCCU	46	47	33	29
NCSA	1	2	3	0
NCSU	202	223	207	191
UNC-A	56	85	56	53
UNC-CH	77	88	72	87
UNC-C	255	300	239	313
UNC-G	158	205	122	190
UNC-P	85	116	90	94
UNC-W	257	306	323	370
WCU	111	131	124	166
WSSU	29	25	29	39
UNC Total	1,842	2,084	1,788	2,112

The guidelines for CAA apply to transfers from Community Colleges to UNC institutions and to transfers within the Community College system. The general education core that is portable and transferable as a block from Community Colleges to UNC institutions is also portable and transferable among the Community Colleges. From Fall 1999 to Fall 2004, the number of students transferring from Community College to Community College increased from 915 to 1,454, a 58.9% increase. This sizeable increase is much larger than the increase in Community College curriculum enrollment over the same time period of 17.6%. Though other variables may be involved, it appears that the CAA has facilitated the transfer of students among North Carolina Community Colleges. However, the CAA does not apply to transfer among the UNC institutions.

Information on transfers from UNC institutions to Community Colleges is available from the Statistical Abstract of Higher Education, which is produced on an annual basis by the UNC. (It is available online and includes data for all higher education institutions in North Carolina.) In Fall 2004, a total of 958 students previously enrolled at UNC institutions transferred to Community Colleges. This was a 8.1% increase from Fall 2003 and a 30.5% increase from Fall 1999.

The Statistical Abstract of Higher Education, published annually by UNC, notes that in Fall 2004 a total of 1,901 students transferred from one UNC institution to another UNC institution. North Carolina State University received the most transfers, 265. UNC Charlotte had the highest number of students to transfer to another UNC institution, 317.

PRELIMINARY FINDINGS

1. The Comprehensive Articulation Agreement (CAA), developed by the two systems and approved in 1997 by the UNC Board of Governors and the State Board of Community Colleges, has significantly improved the transfer process for Community College students to UNC institutions; in addition, the number of students transferring from a Community College to another Community College has dramatically increased.

2. A study was recently done by MGT of America of the CAA and its impact on the transfer process. The study stated that the CAA is "widely perceived as indeed having improved the transfer of associate in arts and associate in science degrees. It is perceived that the primary strengths of the CAA include standardizing the transfer process and providing students with a path and plan for transferring. Quantitative data support that a greater number of students are transferring between North Carolina Community Colleges and UNC institutions."

3. Numerous changes and enhancements were recommended in the MGT of America study and are being addressed by the UNC Board of Governors and the State Board of Community Colleges. These changes will strengthen the CAA and improve the transfer process for Community College students.

4. Over the past four reporting periods, NCCCS transfers to UNC institutions have increased by 27.1%. Students that transferred without the associate degree showed a larger increase (35.5%) than those with the associate degree (14.7%). A dip in Fall 2003 transfers with the associate degree was followed in Fall 2004 by a significant increase. The Fall 2003 dip may be a reporting anomaly attributable to a new information system implemented by the NCCCS over the past several years.

5. The CAA does not apply to transfer among the UNC institutions. That is the general education core of one UNC institution does not automatically transfer as meeting the general education core at another UNC campus. This may inhibit the mobility of students from one University to another (unless the institutions already do so informally).

4G. THE ROLE OF THE LIBERAL ARTS

The role of the liberal arts actually increases in importance as the knowledge economy grows. While at first glance the knowledge economy requires specialized skills, especially in science, math and technology, it actually most prizes employees who have strong critical thinking and problem solving skills; who have effective communication skills; who have the ability to work in collaborative teams; who have intellectual curiosity; and who can not just make a living but be productive citizens and contributing community members. As someone once said, "Education is what's left after you have forgotten everything you have been taught."

The knowledge and skills of the liberally educated graduate of higher education have also become more valuable because, unlike in previous eras, most graduates will have multiple careers and will work with technologies yet to be invented. Thus those entering the knowledge economy must have a high degree of flexibility and the ability to be lifelong learners. They must also have a sensitivity to the demands of operating within a global society and economy. For these and other reasons, it will be crucial that the preparation of the future workforce not just be considered a vocational enterprise, but rather a total education challenge. As the earlier analysis shows there is an increasing demand for employees who have the so called "soft skills."

Fortunately, both the NCCCS and the UNC have made a strong commitment to the liberal arts in their academic programs. UNC institutions have a wide-range of liberal arts majors, most of which produce significant numbers of graduates. Of greatest importance, though, are the general education core requirements in both systems. Both systems have extensive general education/core requirements. Furthermore, a number of statutes have helped ensure the transferability of general education courses between the two systems. Statutes in the 1995 legislative session led to considerable activity in 1996, resulting in an agreed upon transferable general education core. This core is portable and transferable as a block across the Community College system and to all University of North Carolina institutions, as long as the student has at least a 2.0 GPA and a C or better grade in each core course. However, there is not a comparable block transfer of a general education core among University of North Carolina institutions.

The associate in arts and associate in science degree programs in the NCCCS require a total of 64-65 semester hours credit for graduation. Of these credit hours, 44 represent the general education transfer core. These include study in the areas of humanities and fine arts, social and behavioral sciences, natural sciences and mathematics, and English composition.

The course distribution for the general core for Community Colleges is as follows:

English Composition (6 Semester Hours Credit)

Humanities/Fine Arts (9-12 Semester Hours Credit)
Four courses from at least three of the following discipline areas: music, art, drama, dance, French, German, Italian, Russian, Spanish, interdisciplinary humanities, literature, philosophy, and religion. At least one course must be a literature course. (3 SHC in Speech/Communication may be substituted for 3 SHC in Humanities/Fine Arts. Speech/Communication may not substitute for the literature requirement).

Social/Behavioral Sciences (9-12 Semester Hours Credit)
Four courses from at least three of the following discipline areas: anthropology, economics, geography, history, political science, psychology, and sociology. At least one course must be a history course.

Natural Sciences/Mathematics (14-20 Semester Hours Credit)
Natural Sciences (8 SHC): Two courses, including accompanying laboratory work from among the biological and physical science disciplines.
Mathematics (6 SHC): At least one introductory mathematics course (college algebra, trigonometry, calculus, etc.) must be selected; the other unit may be selected from among other quantitative subjects, such as computer science and statistics.

The specific courses used to fulfill the requirement in each of these areas are identified by each Community College as meeting its own general education requirements. The courses are drawn from those courses designated in the North Carolina Community College Common Course Library as being appropriate as part of a general education core transfer curriculum.

The UNC institutions do not have as much uniformity in their general education requirements as do the Community Colleges. Total credits required range from 36 at the School of the Arts to 45 at Chapel Hill. These include courses in the following categories: English; Speech; Foreign Language; Humanities, Literature, Philosophy/Religion; Fine Arts; Social Science, History, Western Civilization, World Cultures; Science; Math; P.E.; and Other. Within these categories, the institutions vary considerably in their requirements. While all institutions have requirements in English (mostly 6 credits), Math (from 2-8 credits), Humanities (from 3-18), Social Science (from 3-21), Science (from 2-14), only six institutions have requirements in Speech, eight in Foreign Language, twelve in Fine Arts, and thirteen in P.E. These variations may help explain why the general education core does not automatically transfer from one UNC institution to another.

Both the Community College and University general education core are very traditional in nature, with a menu of course possibilities distributed over a number of general academic discipline categories. While it is noteworthy that the Community College general education core transfers to UNC, that core was largely developed in 1996 so it has been almost a decade since it was reviewed. Furthermore, proponents of a contemporary general education program suggest it ought to be built on defined skills and knowledge with a clearly articulated set of expectations for the student rather than just a large number of course options. They also suggest that certain skills (such as the ability to work in teams) and knowledge (such as the role of technology in modern society) be incorporated into the general education core.

PRELIMINARY FINDINGS

1. Both NCCCS and UNC institutions have significant requirements in the Liberal Arts.

2. The general education core from the Community Colleges transfers as a block to other NCCCS institutions and to all UNC institutions.

3. The general education core varies considerably from one UNC institution to another.

4. The general education core does not transfer automatically from one UNC institution to another.

5. The NCCCS general education core was largely developed nearly a decade ago and has not undergone a comprehensive review and revision since then. The increased demand for "soft skills" at all levels may also suggest the need to reexamine the role of general education in applied associates degrees, especially as they serve more students who will later seek other degrees.

6. Neither the NCCCS nor the UNC institutions' general education core has a clear articulation of its aims or of the skills and knowledge required. Furthermore, it is not clear that there is sufficient emphasis on developing the "soft skills" in either the general education curriculum or other areas of the curriculum. This has important implications for the preparation of the workforce in a global knowledge economy.

The centrality of the liberal arts in preparing the workforce for a knowledge economy must be reaffirmed. There is every indication that cross-discipline knowledge and skills will be vital preparation for the jobs of tomorrow at every level. From students earning a Ph.D. in science, there will be a significant need for employees with both technical knowledge and "soft skills." This is equally as true for those with Associate of Arts degrees. As the management guru Tom Peters said, "Victory in the brain-based, global economy will go to the perpetually curious." The liberal arts, at its best, creates such lifelong curiosity and inventiveness.

4H. THE ROLE OF HISTORICALLY MINORITY INSTITUTIONS (HMI's)

The UNC has six of its 16 campuses identified as "Historically Minority Institutions" (HMIs); five of these (Elizabeth City State University, Fayetteville State University, North Carolina A&T State University, North Carolina Central University, and Winston-Salem State University) are Historically Black Colleges and Universities (HBCUs). This is an unusually large proportion of the total number of public institutions in the state. These six institutions enrolled a total of 33,682 students (18.9% of the UNC enrollment up from 16.1% in 1999) and awarded 4,636 degrees in 2004 (3,773 bachelors, 835 masters, 28 doctorates). This represents 12.98% of the degrees awarded in the UNC. Of the minority students attending the UNC institutions, 52.6% attend the six HMIs.

These institutions have a long history, with the oldest (Fayetteville State University) being founded in 1867 and the "youngest" (North Carolina Central University) opening its doors in 1909. They tend primarily to serve full-time (ranging from 91% at North Carolina A&T to 77% at UNC Pembroke), majority female (ranging from 68% at WSSU to 52% at North Carolina A&T), and predominantly non-white (ranging from 95% at North Carolina A&T to 49% at UNC Pembroke) students. They have relatively high freshman to sophomore retention rates (ranging from 78.2% at North Carolina Central University to 67.2% at UNC Pembroke). None of them has a six year graduation rate above 50% (ranging from 46.5% at North Carolina Central University to 34.9% at Fayetteville State University).

The changing demographics of the state, with minority population growth projected to be above the national average, further increases the centrality of the HMIs to the growth of the state's economy as does the growth of their programs for all students. North Carolina and its University system have recognized this and have implemented such programs as the "focused growth initiative." This program was established in 1999. One of its primary goals was to continue the historic access for students in North Carolina by disproportionately growing enrollment at those campuses with excess capacity. Seven of the 16 UNC institutions were included (the six HMIs and Western Carolina University, which serves a rural area of the state). Referenced in Attachment 5 of this report as Appendix 4.H.1. is a report on the focused growth program.

The "focused growth" program has received several recurring funding allocations from the legislature ($10M in 1999; $2.3M in 2000; $11M in 2002-03) as well as one-time funding from the legislature, including special funding managed from the Office of the President. In addition, these institutions benefited, disproportionately, from the millennium bond program, receiving $580M for new facilities. The resulting increases in enrollment earned $69M in enrollment growth funding.

These unprecedented investments have allowed the focused growth institutions to, among other initiatives, add 66 new academic degree programs including 29 masters, and 3 doctorates. More academic programs are in the planning stage. Special emphasis has been placed on adding academic programs that respond to regional and state needs. In this time period over half the new bachelors degrees approved in the UNC were at these institutions, as well as over a third of the masters degrees.

Enrollment has increased substantially at these institutions. Between 1999 and 2004, their enrollment increased 36.3% (ranging from 72.4% at Winston Salem-State University to 11.5% at Fayetteville State University). During that same period, the total UNC enrollment increase was 17.8%. In the same period (the first five years of a two-phase ten year plan), research and sponsored program grants among the HMIs more than doubled from $45.3M to $119M.

The academic program array for the HMIs is extensive.

- North Carolina A&T, as one of the state's two land grant institutions, has programs through the doctoral level. Its programs include engineering, arts and sciences, agricultural and environmental sciences, business and economics, education, nursing, technology, and graduate studies. It has over 10,000 students and a graduate enrollment of approximately 1,300. It awarded 1,240 degrees in 2004.

- North Carolina Central University has a total enrollment of over 7,000 and a graduate enrollment of approximately 1,700, and its programs include arts and sciences, business, education, library and information sciences, and a law school. It awarded 956 degrees in 2004.

- Elizabeth City State University has recently been approved for a joint program in pharmacy (with UNC Chapel Hill); it has predominantly undergraduate programs with over 2,400 students. It awarded 363 degrees in 2004.

- Fayetteville State University has over 5,400 students, including approximately 1,000 graduate students, mainly in masters programs, although it also has a doctorate in educational leadership. It has undergraduate programs in business and economics, education, humanities and social sciences, and basic and applied sciences. It awarded 778 degrees in 2004.

- UNC Pembroke, with a total enrollment of just over 5,000 students, offers degrees up through the masters level in arts and sciences, business, and education. It awarded 742 degrees in 2004.

- Winston-Salem State University, with a total enrollment of over 4,800 students, also offers degrees up through the masters; it has a relatively young graduate school. It has undergraduate programs in arts and sciences, business, education, and health sciences. It awarded 557 degrees in 2004.

As the matrix below indicates, the HMIs offer a substantial number of programs, at both the bachelors and masters level, that produce graduates in the projected high growth areas.

	ECSU	FSU	NCAT	NCCU	UNC-P	WSSU
Acct	B	B	B	B	B	B
Bus.	B	BM	BM	BM	BM	BM
CPS	B	B	BM	B	B	BM
Education	BM	BMD	BM	BM	BM	BM
Electr. Eng	-	-	BMD	-	-	-
Nursing	-	B	B	B	B	BM
Clinical Psych	-	-	-	-	-	-
Social Work	B	M	BM	B	B	B
SP/Lang Path	-	-	-	-	-	-
Chem	B	B	BM	BM	B	B

PRELIMINARY FINDINGS

1. The HMIs have benefited enormously from the focused growth initiative, taking considerable advantage of the opportunities presented them. They have been transformed in size, in range of academic programs, and in facilities in a remarkably short period. While the investment has been substantial, the returns already appear to justify both the dollars and commitment to these institutions. Other states have attempted to strengthen their HMIs, but it is hard to imagine any program that has been more successful than this one.

2. The HMIs have not all managed to take equal advantage of the focused growth program (some have more challenging environments than others). For example, the rate of enrollment growth has a very wide range, not all of them have added academic programs that will be in high demand, and the increase in funded research has not been uniform.

3. The HMIs have experienced an unprecedented growth in academic programs, both at the bachelors and masters level. Most of these programs have been in high demand fields. For example, nursing, biotechnology, MBA, and computer science all received focused growth planning funds at Winston-Salem State University; all four of these programs have been identified as high state need programs by this study.

4. The HMIs have put special emphasis on academic programs in the sciences, where there are likely to be overall shortages and where minorities are traditionally seriously underrepresented, yet where increasingly the best employment opportunities are to be found in the knowledge economy.

5. The HMIs are critical to the economic future of the state. Not only are minority (and immigrant populations) increasing at a rate above that of whites (this growth is above the national average in North Carolina, although much of the projected increase is Hispanic), but also these institutions are assuming an increasingly important role in addressing the overall enrollment and economic development needs of the state.

6. The HMIs have considerable ambitions to continue to add new academic programs. This is understandable given their success to date. They are, however, experiencing some challenges as a result of the rapid growth, including managing the faculty recruitment and orientation process and managing infrastructure growth at the same time. Budget and tuition limitations may also impact their ability to secure additional programs, especially those that are high cost programs. Thus the selection of additional programs will need to be paced appropriately and selected strategically, especially as it relates to responding to demonstrated high occupational needs.

5. PRELIMINARY GAP ANALYSIS: STATE NEEDS/ACADEMIC PROGRAMS

This gap analysis section focuses primarily on the identified occupational areas with the greatest projected growth (See Section 3.A) and those emerging areas that may see increased demand (See Section 3.B). In the case of the former, the projections are largely based on data from the Labor Market Information (LMI) Division of the Employment Security Commission of North Carolina, except in teacher education and nursing, where statewide supply/demand reports supplemented the data and in engineering where a NCHEMS supply and demand report was prepared for the system. In the instance of the latter, regional economic development plans and specific industry group plans are examined in conjunction with the ESC data.

For most of the information presented in this section, the UNC and the NCCCS are treated separately. In a few areas where it seems logical to do so, the two systems are treated together.

5.A. PROJECTED HIGH DEMAND TRADITIONAL OCCUPATIONS REQUIRING BACHELORS, MASTERS, DOCTORATES, OR PROFESSIONAL DEGREES

This section examines those occupational growth areas that are currently predicted to require bachelors, masters, doctorate, or professional degrees.

Bachelor Degree Requirements

In the **bachelor degree category** those occupational areas include high (above 300 positions a year) predicted needs for degrees in:

- Nursing (also associate degree)
- Teaching
- Accounting
- Business
- Computing
- Recreation
- Child, Family, School Social Workers

The 2005 production of graduates by UNC in these fields and the five-year patterns are as follows:

- UNC institutions produced 1,105 **nursing** bachelors graduates in 2005. This was the highest number of degrees awarded in the five-year period. (In addition, see the NCCCS section that follows.) The Employment Security Commission data listed a need for 3,760 registered nurses a year. A more detailed analysis is available, however, from the May 2004 "Task Force on the North Carolina Nursing Workforce Report," produced by the North Carolina Institute of Medicine. This report concludes that:

> "The state needs to add a total of 34,812 more RNs to the workforce over 2000 levels (21,975 new jobs plus 12,837 replacement openings) by 2010 in order to meet the demands of both new job growth and replacement openings. Given that approximately 65,000 RNs were in the workforce in 2000, these figures suggest that North Carolina will need to increase its RN workforce by 50% by the end of the decade in order to avoid a shortage." (p.13).

(The report also concludes a similar percentage increase will be needed for LPNs over the same period, 7,874 additional positions over the 2000 workforce of approximately 14,500). Of particular note is the fact that approximately 60% of new RNs entering the North Carolina workforce currently come from out of state (and about 55% of the LPNs). (Also see the NCCCS section that follows.)

- UNC institutions produced 2,434 **teacher education** graduates in 2005. In addition, there were over 5,000 alternative entry students who had a bachelors degree in some field and were taking teacher education courses to qualify for teacher certification. Of these, 1,470 earned the certification in 2005. The projected annual need utilizing the Employment Security Commission Methodology is 4,830. A more detailed analysis, however, is available from the December 2004 report, "A Plan to Address the Shortage of Teachers in North Carolina," produced by the UNC Office of the President.

  That analysis paints a very different picture, with an annual average need of 11,483 over the eleven-year period 2004-05-2014-15, with the highest need in 2014-15 (12,165) and the lowest in 2007-08 (10,984). The methodology uses a projection model based on student-teacher ratios (including assumptions about state plans to reduce class size in K-3 through 2004-05) that is adjusted for turnover replacements (with turnover from one North Carolina school district to another deducted) and new additional teachers needed.

  In addition to examining the general need for teachers in North Carolina, the report also examines such special need areas identified by the North Carolina Department of Public Instruction as math, science, middle grades, and exceptional children. The first two have particular importance in a knowledge economy. UNC institutions produced 84 math teacher education graduates in 2004 (up from 76 in 2003); 59 in science (down from 61); 174 in middle school (up from 126); and 212 in exceptional children (up from 183). UNC projects increasing the number of traditional graduates in these programs to 192 in math a year by 2009-10, to 157 in science, to 353 in middle school, and to 329 in exceptional children.

  All UNC institutions offer undergraduate teacher education programs, except the North Carolina School for the Arts.

- UNC produced 582 bachelors degrees in **accounting** in 2005; this was the highest number awarded in the past five years. The need for accountants and auditors is projected to be 890 annually.

  All UNC institutions offer the bachelors degree in accounting.

- UNC produced 2,175 bachelors degrees in **general business administration and management,** down from the previous year's five year high of 2,246. If the projected high demand fields that may require general business degrees (business operations specialists, financial analysts, loan officers, insurance sales agents) are totaled 1,940 business degrees a year will be needed for these fields alone.

  All UNC institutions offer the bachelors degree in general business.

- UNC produced 664 bachelors degrees in **computer science** in 2005, the highest in the five year period. It produced an additional 38 graduates in Information Science and 297 in electrical, electronics, and communication engineering. The projected need in computer and computer-related fields (computer systems analyst, computer programmers, computer software engineers applications, and computer software engineers, systems software) is approximately 1,770 annually, significantly down from 4,830 in the 2000-2010 data.

  All UNC institutions offer the bachelors degree in computer science.

- UNC produced 413 bachelors degrees in **recreation**; the five year high was 453 in 2001. Appalachian State University, East Carolina University, North Carolina A&T University, North Carolina Central University, North Carolina State University, UNC Chapel Hill, UNC Greensboro, UNC Pembroke, UNC Wilmington, Western Carolina University, and Winston-Salem State University offer recreation degrees.

  The projected need for recreation workers is 530 annually.

- UNC produced 419 graduates in **social work** in 2005, a five year high. The projected annual need for child, family, school social workers is 320.

  All UNC institutions offer the bachelors degree in social work.

Master Degree Requirements

In the **masters degree category**, the high demand occupations include: health specialties teachers; rehabilitation counselors, educational and vocational counselors, business teachers, physical therapists, librarians, and market research analysts.

- UNC institutions produced 507 masters degrees in various **health specialties post-secondary teacher** category in 2005, with Appalachian State University, East Carolina University, North Carolina Central University, North Carolina State University, UNC Chapel Hill, UNC Charlotte, UNC Greensboro, Western Carolina University, and Winston-Salem State University having one or more programs. The projected overall demand is 330 annual positions.

  It should be noted that the recent North Carolina Institute of Medicine study (see page 111) concluded that there is a shortage of qualified nursing faculty in North Carolina. This is particularly true in the NCCCS, where an aging faculty, a need to upgrade nursing faculty to at least masters prepared, and low salaries all contribute to a current shortage that is only likely to increase.

- UNC institutions produced 27 masters in **rehabilitation counseling** in 2005; the five year high was 38 in 2003. The projected annual demand is 300 positions annually. Appalachian State University, East Carolina University, UNC Chapel Hill, and Winston-Salem State University have masters programs in rehabilitation counseling.

- UNC institutions produced 343 **education and vocational counselors** in 2005, down slightly from the five year high of 350 in 2004. The projected demand is 180 positions annually. Appalachian State University, East Carolina University, North Carolina A&T University, North Carolina Central University, North Carolina State University, UNC Chapel Hill, UNC Charlotte, UNC Greensboro, UNC Pembroke, and Western Carolina University have masters programs in this field.

- UNC institutions produced 1,426 masters in **business related fields** in 2005, the highest in the past five years. However, many graduates would not necessarily choose a career in post-secondary teaching, particularly given the salaries in the private sector. The projected demand for such teachers is 170. Thirteen of the UNC institutions offer a masters in business.

- UNC institutions produced 104 masters in **physical therapy** in 2005; the highest number was 118 in 2001. The projected demand is for 170 positions annually. East Carolina University, UNC Chapel Hill, UNC Charlotte, Western Carolina University, and Winston-Salem State University offer this degree.

- UNC institutions produced 344 masters in **library science** in 2005, by far the largest number in the last five years. The projected demand is for 150 positions annually. Appalachian State University, East Carolina University, North Carolina Central University, UNC Chapel Hill, and UNC Greensboro offer this degree.

Doctorate Degree Requirements

The projected high demand occupations requiring a doctorate are nearly all post-secondary faculty positions. Since many higher education institutions recruit nationally, state production of doctorates is not directly relevant (although indirectly each state contributes to the national marketplace). The areas with the greatest need are education (100), computer science (100 annually), nursing (90), and biology (70 annually).

Unless some states produce doctorates at much higher rates than North Carolina there are likely to be gaps in all of these fields (gaps that may be exacerbated by the predicted decline of international students in many of these fields and/or the increase in the number of foreign-born Ph.D.s who will return to their native countries). The size of the gaps could be considerable. For example, UNC institutions produced 25 Ph.D.s (the highest number in the last five years) in computer science in 2005 at UNC Chapel Hill and North Carolina State University, 32 in education, and 7 in nursing. Nursing is a particular concern since there is a shortage of faculty to teach the high demand undergraduate programs. Most of the areas which need new faculty also have to compete with the private sector for graduates.

Two professional areas have high demand for Ph.D.s: medical sciences and clinical counseling and school psychologists. The projected need for Ph.D.s in the medical sciences total 140. UNC institutions (UNC Chapel Hill, North Carolina State University, UNC Charlotte, East Carolina University) produced 111 such Ph.D.s in 2005; the highest total in the last five years was 112 in 2004. The projected need for Ph.D.s in clinical, counseling, and school psychologists is 120. UNC institutions produced 44 Ph.D.s in 2005. The five year high was 54 in 2001. UNC Chapel Hill, North Carolina State University, and UNC Greensboro offer the Ph.D. in this area.

Professional Degree Requirements

The projected high demand occupations requiring professional degrees include lawyers (430 positions annually), pharmacists (300 positions annually), doctors (family and general practitioners 180; physicians/surgeons 170), dentists (150 positions annually), and veterinarians (100 positions annually).

UNC institutions produced a total of 336 law degrees in 2005 (the highest number in the five year period was 403 in 2002); UNC Chapel Hill produced 227 and North Carolina Central University produced 109. UNC institutions produced a total of 146 Pharm.D. degrees in 2005, the highest in the five year period; UNC Chapel Hill offers this degree. UNC institutions produced 226 M.D. degrees in 2005 (the highest number in the five year period was 234 in 2004); UNC Chapel Hill produced 154, East Carolina University produced 72. UNC institutions produced a total of 83 dentistry degrees at UNC Chapel Hill in 2005, the highest number in the five year period.

UNC institutions produced 73 veterinarian degrees in 2005 (the highest number in the five year period was 76 in 2004); North Carolina State University offers veterinary medicine.

5B. PROJECTED HIGH DEMAND TRADITIONAL OCCUPATIONS REQUIRING ASSOCIATE DEGREES/DIPLOMAS/CERTIFICATES

This section examines those occupational growth areas that are currently predicted to require postsecondary education at less than the baccalaureate level, including associate degrees, diplomas, and certificates offered by the 58 Community Colleges.

In addition, it is assumed that the continuing education programs offered by NCCCS, particularly those that directly support the education and training needs of business and industry, will continue to be vital to the future economic growth and development of North Carolina.

Using ESC data, high growth occupations were identified that require an associate degree. Referenced in Attachment 5 of this report as Appendix 5.B.1., All Occupational Projections, gives North Carolina occupational employment projections sorted by level of education. Average annual openings (growth plus replacements) for the 2002-2012 interval are given for each occupation. Occupations pertinent to Community College programs are given in the Associate degree and the Post-secondary Vocational Training categories, with some falling into the Long-term on-the-Job Training category. It is obvious from an analysis of the categories that jobs for which Community College students obtain education and training do not neatly fall into the framework of this classification structure. However, it does give a general overview of occupations for which workers need education and training provided by Community Colleges. Also, many of the occupations are ones for which Community Colleges provide numerous short-term training through non-credit continuing education programs.

The following occupations are ones that show sizeable average annual openings (given in the first set of parentheses) for the 2002-2012 time period using ESC's projections. Completions or graduations in 2004-2005 in the Community College curriculum program that most closely fits each occupation are given in the second set of parentheses (A = associate degree, D = diploma, and C = certificate).

- Registered nurses (3,760) (1,965 A)
- Executive secretaries/administrative assistants (1,590) (387 A)
- Secretaries – excluding legal, medical, and executive (770) (102 D, 363 C)
- Practical and vocational nurses (760) (764 D)
- Cosmetologists (330) (28 A, 304 D, 377 C)
- Computer programmers (450) (155 A, 9 D, 103 C)
- Emergency medical technicians and paramedics (230) (140 A, 1 D, 5 C)
- Medical records/health information technicians/secretaries (940) (494 A, 101 D, 354 C)
- Dental Assistants (480) (239 D)
- Legal secretaries (350) (21 A, 1 D, 17 C)
- Paralegal and legal assistants (280) (283 A, 21 D, 131 C)
- Electrical and electronic engineering technicians (200) (141 A, 182 D, 298 C)
- Dental hygienists (200) (191 A)
- Medical and clinical laboratory technicians (250) (104 A)

- Aircraft mechanics and service technicians (210) (5 A, 13 C)
- Respiratory therapists (200) (176 A)
- Surveying and mapping technicians (180) (24 A)
- Medical transcriptionists (130) (85D, 5 C)
- Surgical technologists (110) (28 A, 160 D)

5C. PROJECTED DEMAND FOR HIGHER EDUCATION (BOTH UNC AND NCCCS) IN EMERGING FIELDS

In addition to examining the Employment Security Commission projections, the regional economic development partnership strategic plans were examined to identify occupations that may have faster growth rates as a result of specific initiatives or because they are emerging fields that would not be captured by trend data. The targeted industries that emerge from this approach include:

- ✓ Biotechnology and pharmaceuticals
- ✓ Computing, software and the Internet
- ✓ Logistics and distribution
- ✓ Advanced manufacturing
- ✓ Advanced materials: chemicals and plastics
- ✓ Advanced materials: nanotechnology
- ✓ Arts and design

- The **biotechnology and pharmaceutical industries** have a high need for workers with postsecondary education and training. Those on the research and development end of the spectrum require predominately baccalaureate or advanced degrees – life scientists, physical scientists, and specialized engineers (biomedical, chemical, industrial), while those heavy on the manufacturing end of the spectrum need a majority of their workforce with less than the baccalaureate degree. Biomanufacturing represents a growth industry in North Carolina and is a key part of the state's strategic focus on biotechnology and related industries. Studies by the North Carolina Biotechnology Center project biomanufacturing to be a large part of North Carolina's future job growth in the biotechnology and pharmaceutical industries.

  ESC occupational projections in this area indicate a need for 17,400 bachelors and above professionals in 2012 (compared to 14,280 in 2002). Technicians (associate degree) show a projected need of 15,640 in 2012 (compared to 13,410 in 2002).

  Relying on data from such trend projections, however, makes little sense in this emerging area. While traditional fields such as chemical engineering, chemistry, the life sciences, microbiology, medical sciences, and biomedical engineering may be producing sufficient graduates currently, the emerging interdisciplinary nature of this industry means that both the current production and projections may not be sufficient. Not only are these sciences becoming more interdisciplinary, but there are also other non-science disciplines (for example, specialized areas of business and law) that will see increased demands as this field emerges and matures.

Currently, UNC Chapel Hill and North Carolina State University offer biomedical engineering bachelors, masters, and doctoral degrees. North Carolina State University and North Carolina A&T offer chemical engineering (the former at all three levels, the latter at the bachelors and masters level). East Carolina University and UNC Chapel Hill offer primarily doctorates in the medical sciences. North Carolina State University offers microbiology at all three levels. North Carolina Central University's BRITE initiative is part of the state's emphasis on biotechnology; the University will develop undergraduate and graduate programs in biomanufacturing and biotechnology. All UNC institutions offer chemistry and biology majors. Several institutions are either just starting or planning to start new programs specifically in biotechnology.

In the NCCCS, biotechnology and related programs are receiving special emphasis. Biomanufacturing is projected to be a major growth area for North Carolina. The NCCCS, with the aid of the Golden LEAF Foundation, has established the BioNetwork to provide education and training for the emerging biotechnology area. This special funding has allowed the establishment of the biotechnology office at the Community College System Office, the selection of six BioNetwork Competitiveness Centers on Community College campuses, and provided approximately 65 innovation, equipment/facility enhancement, and distance learning grants to the Colleges.

The NCCCS has curriculum programs in biotechnology (at five Colleges and at 24 others by way of collaborative arrangements) and industrial pharmaceutical technology (at two Colleges and collaboratively at three others). Another College is planning a plant biotechnology curriculum to be submitted for approval later this year. Completions or graduations for these programs are shown in Attachment 5 of this report as Appendix 4.A.3. Industrial pharmaceutical technology has shown the highest graduation rate, with 18 AAS graduates in 2004-2005. As the BioNetwork initiative continues to develop system-wide, enrollments are expected to significantly increase.

Forsyth Technical Community College received a $5 million grant in 2004 that partners it with four other Community Colleges from around the nation to develop curricula and training modules for biotechnology workers. This initiative is part of a national effort to address workforce challenges facing the biotechnology industry.

- **Computing, Software and Internet**. See previous analysis regarding UNC production in this area.

UNC institutions produced 664 bachelors degrees in **computer science** in 2005; the highest number of degrees awarded in the five-year period (1999-2003) was 720 in 2003. The projected annual need is for 1,770 bachelors degrees.

The NCCCS offers 13 curriculum programs leading to the AAS degree that fall into the area of computing, software, and the Internet. In 2004-2005, only five had significant graduations at the associate degree level: **computer programming** (155); **information systems** (454); **network administration and support** (368); **Internet technologies** (123); and **networking technology** (60). All five of these programs offer tracks that lead to a diploma or a certificate. Students that take one of these options usually chose the one-semester certificate program. In 2004-2005, certificate completions in these five programs were: computer programming – 103, information systems – 348, network administration and support – 184, Internet technologies – 61, and networking technology – 36. Almost all of the above programs showed a decrease in completions from the prior year.

- **Logistics and Distribution**, while a growing industry, has a relatively low proportion of its positions in occupations that require a bachelors degree (approximately 5%) in such areas as business, marketing, accounting, industrial relations, or economics. Some universities offer certificates in logistics and a few offer masters degrees. No UNC institution offers a degree program in this area.

  The NCCCS has one curriculum program in this area, logistics management. In 2004-2005, there was one completion in this program. With the recent opening of a large Dell manufacturing facility in Winston-Salem, logistics and distribution education and training needs will increase.

- **Advanced Manufacturing** as an industry also has a relatively low proportion of its employment in bachelors (or above) required occupations. Of those that do (commercial and industrial designer, mechanical engineer, electrical engineer, industrial engineer, and computer programmer) several have been covered in the previous analysis. In addition, a 2003 study for the UNC President's Office by the National Center for Higher Education Management Systems (NCHEMS) found an oversupply of engineering graduates by UNC institutions, with the exception of electrical engineering and some select masters degrees for practicing professionals.

- The **Chemical and Plastics** industry has been identified as an emerging and targeted area for growth. Fewer than half of the occupations in this field require a bachelors degree or above. Those that do generally require degrees in business or engineering, both discussed previously. In 2000-01 the NCHEMS report on engineering indicated that UNC institutions produced 166 bachelors degrees in chemical engineering for 30 average annual openings.

  In the NCCCS, Manufacturing Technology/Plastics is offered by eight Colleges, including a consortium in the Raleigh region with seven member Colleges.

- **Nanotechnology** is a fast-emerging, highly interdisciplinary field that will probably influence a number of occupations in several industries rather than create specific industries of its own. Therefore, it is not possible at this time to anticipate the openings or even the degrees required (existing disciplines such as engineering have to be infused with the life sciences and different modes of thinking). A number of UNC institutions are planning degrees in this field.

  Forsyth Technical Community College in Winston-Salem received approval in September 2004 from the State Board of Community Colleges to establish an AAS degree program in **nanotechnology**. This program is offered in collaboration with Wake Forest University's Center for Nanotechnology and Molecular Materials. It is the only nanotechnology program offered in the NCCCS.

- **Art & Design** "industries" are often forgotten when discussing workforce and economic development. However, not only is there demand for such professionals in and of themselves, but such professionals contribute to the quality of life and sense of place that can be major factors in economic development. The occupations include fine artists, multimedia artists and animators, and art directors; they also include design occupations, such as commercial and industrial designers of manufactured products, fashion designers, floral designers, graphic designers, and interior designers. Most of these fields, with the exception of floral design, either require a bachelors degree or the person's skills are enhanced by getting a degree.

  Art degrees, both visual and performing, are available from multiple UNC institutions, and in 2003 1,263 bachelors degrees, 142 masters, and 14 doctorates were awarded in the fine and applied arts. Design and visual communications degrees are offered by North Carolina State University; graphic design is offered by Appalachian State University, North Carolina State University and North Carolina A&T; industrial design is offered by Appalachian State University and North Carolina State University; and interior design at Appalachian State University, East Carolina University, UNC Greensboro, and Western Carolina University. In addition, to these programs, North Carolina also has the North Carolina School for the Arts that includes a $12M Center for Design Innovation.

  The NCCCS has a cluster of curriculum programs called the Commercial and Artistic Production Technologies. Included are several professional crafts programs (e.g., clay, fiber, and jewelry), photographic technology, interior design, film and video production, and digital effects/animation.

5D. CAUTIONS

A number of cautions have to be outlined about this interim gap analysis:

- This analysis focuses on the UNC and the NCCCS institutions.

  The UNC and NCCCS institutions are not, however, the sole providers of graduates in the state. Independent colleges and proprietary schools also produce graduates in a number of these areas. Most Community College students stay in the area where they attend college. Students from the independent colleges and universities, particularly the larger ones, may come from out-of-state and may be less likely to enter the North Carolina workforce than graduates from the UNC institutions. Nevertheless, the independent colleges clearly do contribute to the workforce. For example, in 2004 they produced 3,315 graduates in business (compared to 4,789 by UNC), 478 in computer science (721), and 572 in education (2,026). In total, independent colleges produce about half as many graduates as UNC (12,218 bachelors to 25,263; 2,831 masters to 7,432; 1,111 first professional to 898; and 308 doctorates to 850).

- This analysis does not examine migration patterns. Many states experience a net in-migration of graduates, especially in the high demand fields. This is particularly true for certain southern states where in-migration has been extensive, especially from midwestern and northeastern states. Nursing, for example, has over 50% of its new and replacement workforce coming from out of state. Teacher education, computer science, and pharmacy have significant in-migration.

- This analysis focuses on new graduates, most of whom will be new to the workforce. However, the majority of the workforce for 2012 is already in the workforce.

- This analysis does not consider the intent of students in receiving degrees in certain areas. For example, some students who take degrees in areas like education, nursing, and social work do not necessarily intend to enter the workforce in those fields.

- This analysis looks at trend data for projected job growth. Trend data cannot anticipate either abrupt changes in the economy (such as the reversals faced in computer fields around 2000) or intentional changes in state policy to fuel new directions in the state's economy.

- This analysis does not, at this point, examine these trends by geographic region. While it is possible to see projected job growth by region, there is not a reliable way to predict where graduates will go for employment. Some academic areas (education, for example) tend to see their graduates employed in the region where they got their degree; other academic areas (such as engineering and computer science) tend to see their graduates gravitate to where the best jobs, salaries, and quality of life are offered.

9. There are substantial gaps in the production of professional degrees:

   - Pharmacy (annual gap of 154)
   - Doctors (annual gap of 124)
   - Lawyers (annual gap of 94)
   - Dentists (annual gap of 67)
   - Veterinarians (annual gap of 27)

10.a. In the emerging industries and/or the industries that are part of regional initiatives, UNC institutions will need to produce sufficient graduates especially in the life sciences and computer sciences particularly for the biotechnology and pharmaceutical industries. It appears that UNC institutions are responding to this need, particularly in biotechnology.

b. In the emerging industries and/or the industries that are part of regional initiatives, UNC institutions will need to produce sufficient graduates with either specialized or interdisciplinary skills in such areas as business and engineering. While the institutions are producing sufficient graduates in those fields, they may need to reexamine the curriculum and/or the need for new concentrations, specialized certificates, or masters programs. This is true for the logistics and distribution industry; advanced manufacturing; and chemical and plastics.

c. In nanotechnology, UNC institutions do not presently have as many programs available as do the leading states.

d. In arts and design there are great possibilities for expanding both employment opportunities and quality of life issues that can be central to economic development. A number of UNC institutions have identified this as a growth area.

e. In virtually all gap areas (from traditional fields like nursing and teaching to emerging fields like nanotechnology and logistics) there are great opportunities for expanded partnerships and "ladder" programs between NCCCS institutions and UNC institutions. There are a number of such existing programs and prototypes, including some that use e-learning exclusively. Thus the primary issue is one of scaling up such activities and program availability.

NORTH CAROLINA COMMUNITY COLLEGE SYSTEM

1. Community Colleges are not producing an adequate number of graduates to meet projected needs in the following high demand areas:

   - Registered nurses (see prior discussion in UNC section)
   - Office staff – including executive secretaries, administrative assistants, and so on. (annual gap of several hundred, depending on how projected needs are viewed)
   - Computer programmers (annual gap of 295 at associate degree level)
   - Emergency medical technicians (annual gap of 90)
   - Legal secretaries (annual gap of 329 at associate degree level)
   - Medical and clinical lab technicians (annual gap of 146)
   - Aircraft mechanics and service technicians (annual gap of 205 at associate degree level)
   - Surveying and mapping technicians (annual gap of 156)
   - Medical transcriptionists (annual gap of 45)

   It should be noted that as technology becomes more embedded in the workplace, it will have impacts that are difficult to precisely measure at this time. For example, as the information needed and used by health care providers (for example, medical records) becomes digitized, it will have a dramatic impact on those work places, including the skills needed by workers.

2. According to the occupational projections developed in this study using ESC data, the NCCCS is not producing an over supply of graduates in any of the high growth areas.

3. The NCCCS is responding to the targeted industries that emerge from the trend data (e.g., biotechnology and pharmaceuticals), though its responses are in the early stages. The BioNetwork initiative is in its second year of operation and has offered significant opportunities for collaboration with UNC institutions, particularly North Carolina State University. This should serve as a model as other emerging industries (for example, nanotechnology) expand and present the need for increased numbers of trained workers.

4. As noted in the UNC section above, there are many opportunities for new and expanded partnerships between the two public higher education systems. Addressing the needs in some critical areas, such as increasing the supply of teachers and nurses, has more to do with building new and better collaborative programs than with building new brick and mortar facilities.

5. Distance learning options should be a critical consideration in all plans to expand programs, to develop collaborative arrangements, or to provide new services. This should apply to both systems.

6. A NEW COMMUNITY OF LEARNERS

In developing the academic and training programs of the future, it is important to recognize the many different kinds of student learners to which higher education must now be responsive. The students entering universities and community colleges represent a broad range of ages and experiences, economic, family and ethnic backgrounds. They are also driven by a variety of motivations that bring them into the college classroom.

As in the past, many higher education students are there to obtain the necessary skills to prepare them for their *first job*. Whether in a degree program or a technical training/certification program, these students are generally preparing to enter the workforce for the first time. They may be recent high school graduates, or coming into the workforce well after high school after years spent in other life pursuits.

Increasingly, a growing number of students are returning to higher education in order to *maintain* the careers that they already have. In today's competitive economy, industries and professions are changing rapidly, driven by new technological innovations, new technical knowledge, new products and services, new regulations, or changing consumer demands. The skills and knowledge required to maintain one's current position, and certainly to advance to more senior levels, require a constant retraining and reeducation. This continuing need for learning may be fulfilled by a single training session, an additional certification, or the achievement of a more advanced degree. The demand comes from students who are typically older, further along in their work and personal life responsibilities, and less able to sit in a traditional classroom or follow a traditional program of study. Student/faculty interactions, and modes of course delivery, must be adapted to meet these differing needs. This group of students is one of the fastest growing groups making demands on higher education. They require a wholly different understanding of their needs and the support structures required by them, versus the educational programs, financial and academic support structures in place thirty years ago.

Similar to the students returning to maintain their careers, an additional growing number of learners are turning to higher education to assist them in *changing* their career path. This change may be forced upon them due to job layoffs or a change of personal circumstances. Or it may result from a change in personal career choices and/or lifestyle. Here we see the long-term worker suddenly without employment and without transportable skills; or the middle-aged or retired workers rethinking their career history and seeking a new direction in their lives. A key driver here is the speed with which the education and training can be accomplished, a greater urgency to arrive at an end point that places one into that next job. For these learners, the traditional higher education programmatic structures and timelines, and the locations and/or modes of delivery may be especially inadequate. This group is relatively newly recognized within the higher education environment. For North Carolina, in the midst of its economic transformation and its pressing needs for workers within certain professions, this group of learners requires special attention.

In planning for North Carolina's future in higher education, old patterns and structures and formulas may no longer be sufficient to serve this far more diverse student population. It is a population which no longer experiences higher education at only one point in their lives. And it is a population that has many different expectations for its higher education experience. This is one of the many challenges that state and higher education officials must address in its planning for educating North Carolinians into this future workforce.

7. ADDITIONAL TOPICS

Technology Transfer, Research, Campus Culture and State Support for Innovation

- **Technology Transfer.** Universities have a responsibility to add to the body of knowledge through their research. Where this research has direct and practical applications for industry and business, the "technology" needs to be "transferred" from the research lab in a university to the marketplace through business and industry. This can be done through a number of different mechanisms such as industry-sponsored research, inventions, licensing intellectual property, and helping create start-up companies.

  ✓ **Industry Sponsored Research.** In North Carolina and in every other state, funding from federal agencies provides a very high proportion of the total research dollars. In FY04 UNC institutions generated $1.016 billion in total research awards, of that $664.8 million was federal research and $49.6 million was industry sponsored research. Industry sponsored research reveals, to some degree, the extent of engagement Universities have with their state and national businesses and industries. Exhibit 1 below arrays these data.

Exhibit 1: Selected Sponsored Research Award Data FY 2002 through FY 2004

	# of Awards						
	FY02		FY03		FY04		
Sponsor	Number	% of Total	Number	% of Total	Number	% of Total	Trend
N. C. Business and Industry	313	4.43%	368	4.99%	261	3.44%	-17%
All Other Business and Industry	904	12.80%	1,048	14.20%	1,154	15.21%	28%
Total Business and Industry Awards	**1,217**	**17.23%**	**1,416**	**19.19%**	**1,415**	**18.65%**	16%
UNC TOTAL AWARDS	**7,065**		**7,380**		**7,586**		7%

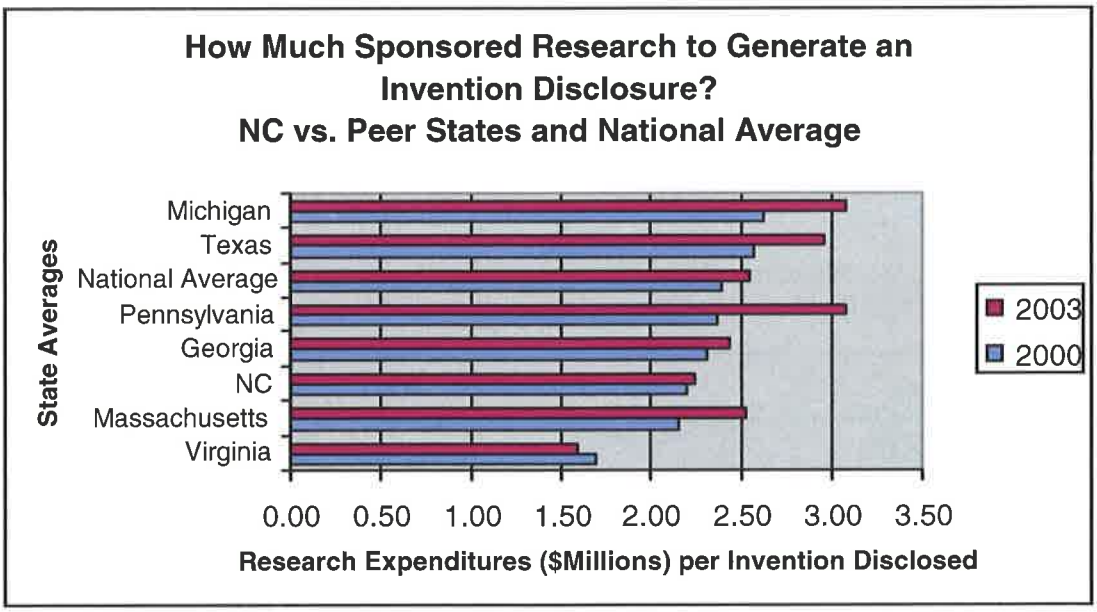
	Dollars Received						
Sponsor	Fiscal 2002	% of Total	Fiscal 2003	% of Total	Fiscal 2004	% of Total	Trend
N. C. Business and Industry	$8,569,699	1.02%	$8,171,060	0.87%	$7,194,387	0.71%	-16%
All Other Business and Industry	$29,922,886	3.56%	$54,437,004	5.78%	$42,416,451	4.17%	42%
Total Business and Industry Awards	$38,492,585	4.58%	$62,608,064	6.65%	$49,610,838	4.88%	29%
UNC TOTAL AWARDS	**$840,556,027**		**$941,276,688**		**$1,016,473,232**		21%

Note: The category 'Not-for-Profit Organizations' and its corresponding sub-categories are new in FY 2004 and may have impact on FY 2004 figures.

Data tracked by the UNC Office of the President

✓ **Invention Disclosure.** The number of invention disclosures per million dollars of research is a surrogate for measuring the amount of intellectual property generated by the research efforts. (An invention disclosure is made at the conception of an invention and is the first step in seeking a patent.) Select UNC institutions (plus Duke and Wake Forest Universities) expended an average of $2.2M per disclosure in both FY 2000 and FY 2003. National and peer data were also examined for both years and are reported in Exhibit 2 below.

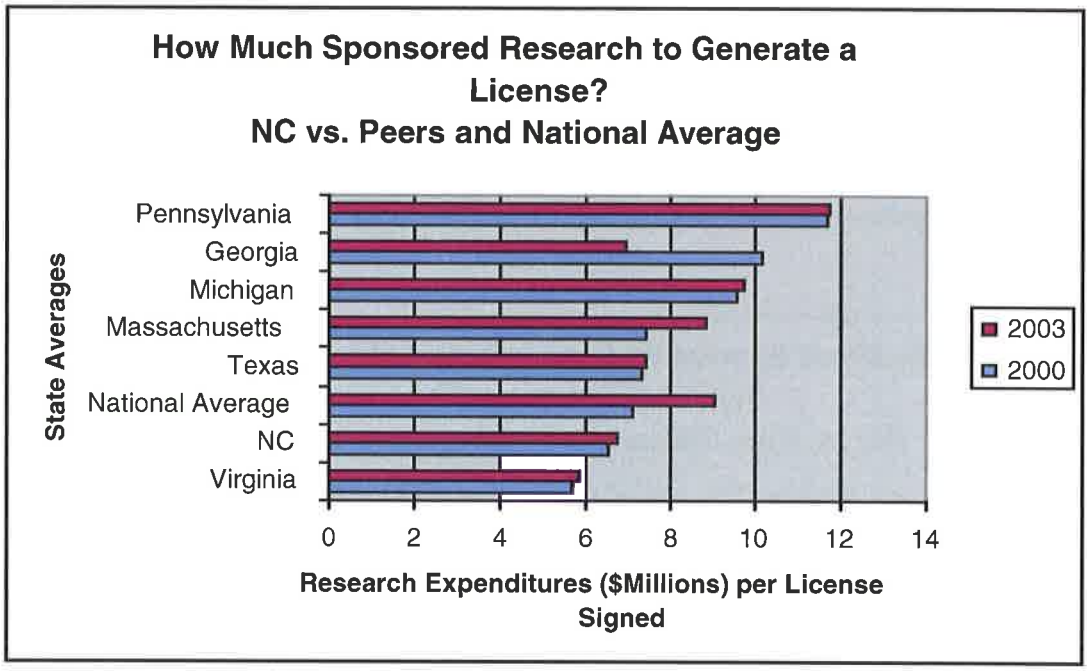
Exhibit 2: Sponsored research expenditures per invention disclosed, FY 2000 and FY 2003



Sources: Association of University Technology Managers (AUTM)
FY 2000-2003 Annual Surveys
Peer States (Georgia, Michigan, Texas, Massachusetts, Pennsylvania, and Virginia) were selected from the 2003 Tracking Innovation Report of the North Carolina Board of Science and Technology.

✓ **Licensing Intellectual Property.** This measure examines how many research dollars, on average, were expended in relation to licenses or options signed. Select UNC institutions (plus Duke and Wake Forest Universities) expended $6.5M per license in 2000 and $6.7M in 2003. National average and peer data were also examined for both years and are reported in Exhibit 3 on the following page.

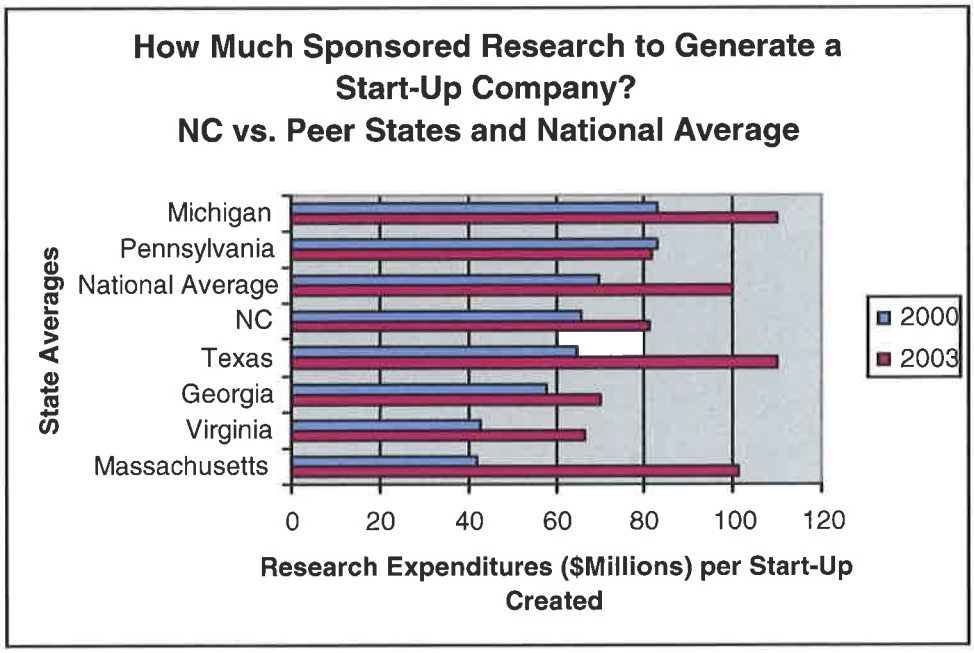
Exhibit 3: Sponsored research expenditures per license/option signed, FY 2000 and FY 2003



Sources: Association of University Technology Managers (AUTM)
FY 2000-2003 Annual Surveys
Peer States (Georgia, Michigan, Texas, Massachusetts, Pennsylvania, and Virginia) were selected from the 2003 Tracking Innovation Report of the North Carolina Board of Science and Technology.

- ✓ **University Start-Up Company Formation.** This measure examines, on average, the number of start-up companies formed as a result of University intellectual involvement in relation to total research dollars expended. Select UNC institutions (plus Duke and Wake Forest Universities) expended on average $66M per University start-up company created. National average and peer data were also examined for both years and are displayed as Exhibit 4 on the next page.

Exhibit 4: Sponsored research expenditures per university start-up company created, FY 2000 and FY 2003



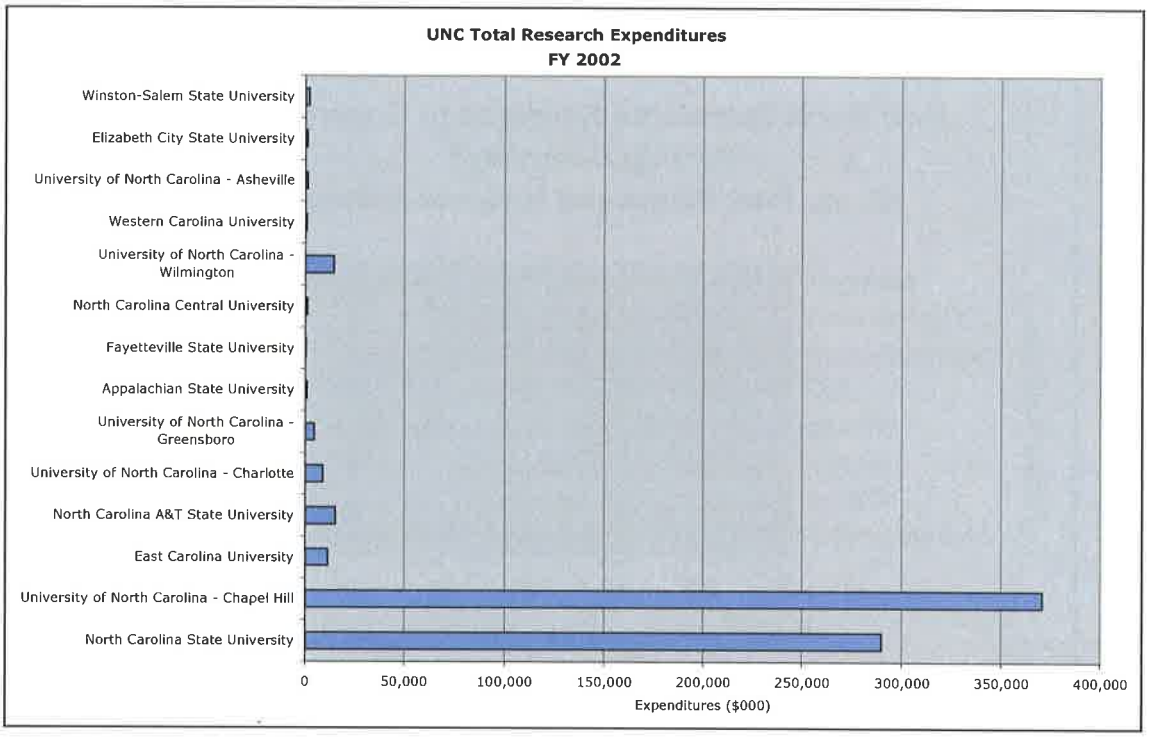
Sources: Association of University Technology Managers (AUTM)
FY 2000-2003 Annual Surveys
Peer States (Georgia, Michigan, Texas, Massachusetts, Pennsylvania, and Virginia) were selected from the 2003 Tracking Innovation Report of the North Carolina Board of Science and Technology.

- **Research.** Funded research is an indicator of the quality of the research faculty and, therefore, has a relationship to the universities' role in economic development, although it is important to note that not all funded research has a direct relationship to economic development. While all UNC institutions have some involvement in funded research, North Carolina, like most states, has its research concentrated in a relatively small number of institutions.

  UNC total research expenditures in FY2002 were $722.6 million. Of that total, UNC Chapel Hill expended $370.8 million and North Carolina State University expended $290 million, followed by North Carolina A&T at $15.4 million, UNC Wilmington at $14.6 million, and East Carolina University at $11.5 million.

  A similar pattern exists when just federal research expenditures are examined. Total federal expenditures in FY2002 were $372.5 million with UNC Chapel Hill at $254.6 million, North Carolina State University $75.2 million, North Carolina A&T $12.0 million, UNC Wilmington $10.0 million, and East Carolina University $6.0 million. Utilizing data from TheCenter at the University of Florida, national rankings were established for these universities and appear as Exhibits 5 and 6 on the following pages.

Exhibit 5

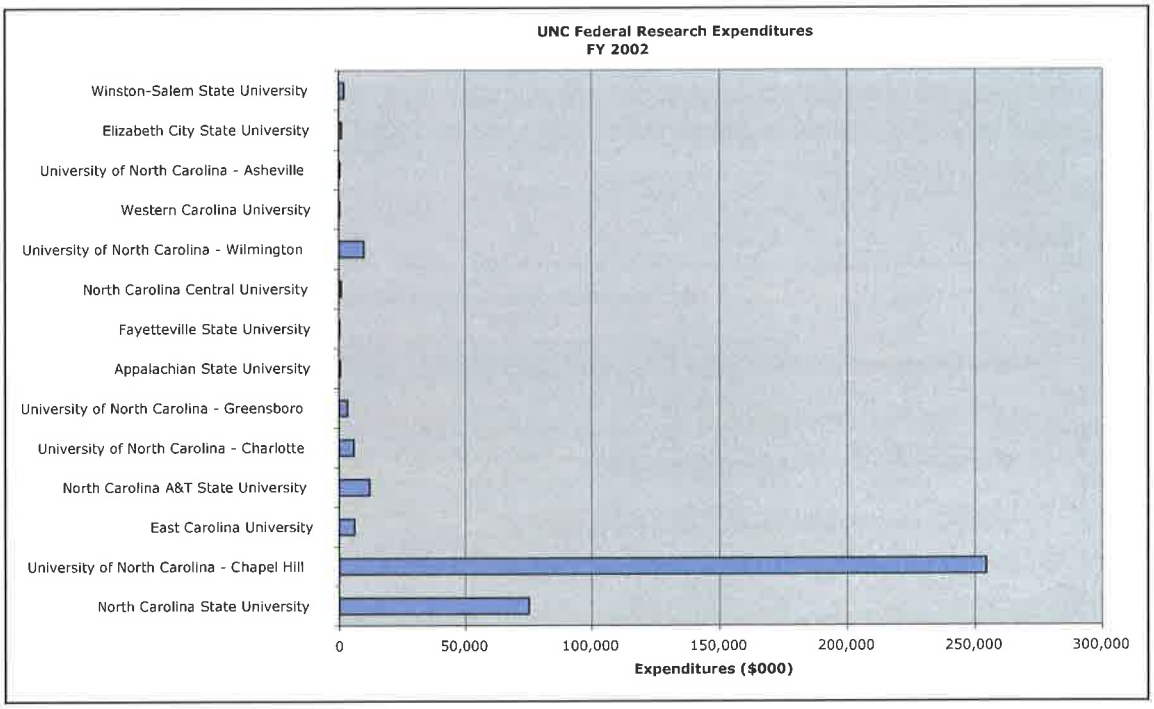


Source: http://thecenter.ufl.edu

UNC Universities with Research Dollars	2002 *** Total Research x $1000	2002 *** National Rank All Universities	2002 *** Control Rank Public Universities
Doctoral/Research-Extensive			
North Carolina State University	290,018	33	21
University of North Carolina - Chapel Hill	370,806	28	17
Doctoral/Research-Intensive			
East Carolina University	11,513	258	189
North Carolina A&T State University	15,353	234	171
University of North Carolina - Charlotte	8,773	284	206
University of North Carolina - Greensboro	4,454	328	236
Master's Comprehensive			
Appalachian State University	781	510	334
Fayetteville State University	311	565	361
North Carolina Central University	1,035	479	316
University of North Carolina - Wilmington	14,568	238	175
Western Carolina University	653	525	344
Baccalaureate-Liberal Arts			
University of North Carolina - Asheville	1,232	452	304
Baccalaureate-General			
Elizabeth City State University	1,058	475	313
Winston-Salem State University	2,022	406	282

Source: http://thecenter.ufl.edu

Exhibit 6



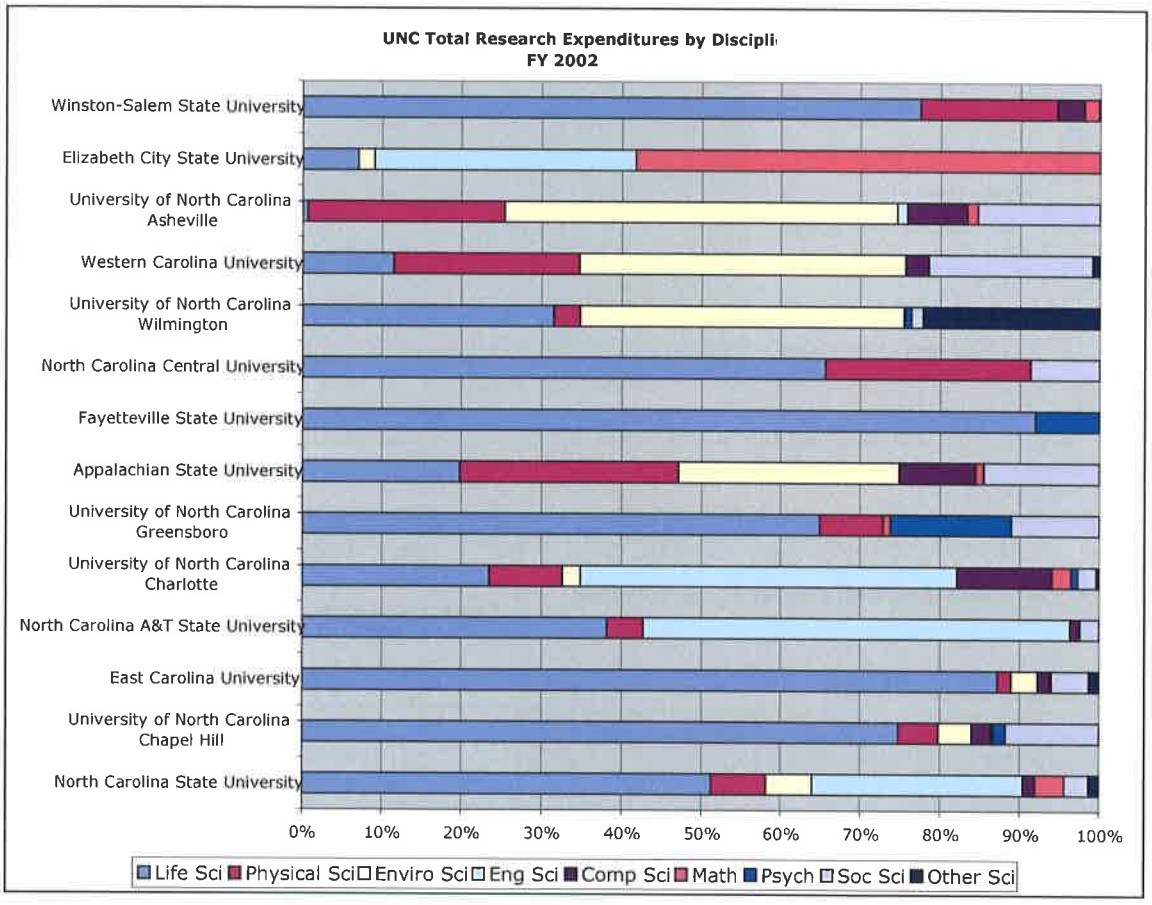
Source: http://thecenter.ufl.edu

UNC Universities with Federal Research Dollars	2002 *** Federal Research x $1000	2002 *** National Rank All Universities	2002 *** Control Rank Public Universities
Doctoral/Research-Extensive			
North Carolina State University	75,204	92	60
University of North Carolina - Chapel Hill	254,571	22	10
Doctoral/Research-Intensive			
East Carolina University	6,030	262	189
North Carolina A&T State University	11,953	211	150
University of North Carolina - Charlotte	5,850	268	192
University of North Carolina - Greensboro	3,340	313	223
Master's Comprehensive			
Appalachian State University	543	472	315
Fayetteville State University	311	514	335
North Carolina Central University	971	414	289
University of North Carolina - Wilmington	9,950	226	163
Western Carolina University	280	521	338
Baccalaureate-Liberal Arts			
University of North Carolina - Asheville	412	490	324
Baccalaureate-General			
Elizabeth City State University	1,058	402	282
Winston-Salem State University	2,022	346	247

Source: http://thecenter.ufl.edu

These research expenditures, when examined by discipline (See Exhibit 7), show strong life sciences concentration on most UNC campuses. Seven of the universities (including UNC Chapel Hill and North Carolina State University) have over 50% of their funded research activity in the life sciences area; twelve of the Universities have research expenditures in the physical sciences, and five have research expenditures in the engineering sciences.

Exhibit 7



Source: http://thecenter.ufl.edu

This research activity is supported by graduate education, particularly at the Ph.D. level. As the gap analysis contained earlier in this report indicated, UNC institutions produced a total of 850 doctorates, a substantial number of which are in the high demand occupations (although, as was pointed out, most of these are for faculty careers where the marketplace is national not state). UNC Chapel Hill ranks 17 for public universities nationally in the number of doctorates produced (412), followed by North Carolina State University at 24 (322), and UNC Greensboro at 108 (67). Many of these doctorates are awarded in fields that do not produce funded research.

- **Campus Culture and State Support for Innovation.** In addition to the measurable items above, successful University involvement in research and technology transfer requires a supportive campus culture for and a state commitment to research, innovation, and entrepreneurship. The UNC Technology Development Initiative (TDI) examined campus issues and developed a number of recommendations, such as training for faculty and administrators in innovation and entrepreneurship; incorporating these activities into promotion and tenure guidelines; explicit identification of economic development as a central mission; and recognition for success for the period 2000-2004. Other states, such as Georgia and California, have created models to invest state dollars to stimulate economic growth by leveraging University innovations and partnerships with the private sector. Georgia, for example, has created "Centers for Innovation" in targeted areas of research strength and state need. (See http://www.georgiainnovation.org/ for more details). California, through its "California Institutes for Science and Innovation" and its "University of California Discovery (See http://www.ucop.edu/california-institutes/about/about.htm and http://uc-industry.berkeley.edu/about/goals.htm for more details.) is investing both in specific areas with the former program (for example, bioengineering, biotechnology, and quantitative biomedicine; telecommunications and information technology; and nanosystems) and in general collaborative research with the latter. The most competitive states in innovation and technology transfer will be those that have both supportive campus cultures and focused state support.

PRELIMINARY FINDINGS

I. TECHNOLOGY TRANSFER

1. UNC institutions are trending upward on total research awards (21%), federal research (65.4%), and industry sponsored research (29%). However, business and industry outside of North Carolina have fueled that growth; industry-sponsored awards from North Carolina business and industry have declined 16%. (Note: some data definition changes might have impacted to some degree these percentages.)

2. UNC institutions are, in relation to the overall research activity, only minimally involved in joint research with North Carolina business and industry. This equates at best to 1% of the total research amount awarded.

3. North Carolina selected institutions (Duke University, East Carolina University, North Carolina State University, UNC Chapel Hill, UNC Charlotte, and Wake Forest University) at $2.2M per invention disclosure, were more efficient than the national average in both years examined (national averages $2.4M in FY 2000 and $2.5M in FY 2003.)

4. North Carolina selected institutions ranked second of seven states (behind only Virginia) examined in 2003 in efficiency of invention disclosures. In 2000, North Carolina was behind Virginia and Massachusetts and ahead of Georgia, Pennsylvania, Texas, and Michigan.)

5. North Carolina selected institutions, at $6.7M in 2003 and $6.5M in 2000 per license, were more efficient than the national average in both years examined.

6. North Carolina selected institutions ranked second of seven states in both years (behind Virginia) in their efficiency at converting research dollars into licenses.

7. North Carolina selected institutions are below the national averages in both 2003 and 2000 (more so in 2003), for research dollars expended per university start-up company created. North Carolina institutions expended $88M in 2003 compared to a national average of $100M. (In 2000, it expended $66M compared to the national average of $70M.)

8. North Carolina selected institutions ranked fourth (behind Massachusetts, Virginia, and Georgia) in their efficiency at converting research dollars into start-up companies created. They ranked fifth in 2000.

Overall, then, the technology transfer findings indicate select North Carolina institutions compare favorably to both national averages and to some other states, although they do not have a dominant competitive advantage in any of the areas. In addition, it appears that potential exists to grow significantly the North Carolina business and industry sponsored research.

II. RESEARCH

1. UNC Chapel Hill ranks 17 in total research expenditures by public universities (2002 data), followed by North Carolina State University (21), North Carolina A&T (171), UNC Wilmington (175), and East Carolina University (189).

2. UNC Chapel Hill also ranks very high (10) on federal research expenditures by public universities (2002 data), with a larger gap before the next institution; University of North Carolina State University (60). These two institutions were followed by North Carolina A&T (150), UNC Wilmington (163), and East Carolina University (189).

3. The two primary doctoral research universities (UNC Chapel Hill and North Carolina State University) have strong national rankings. They, and many of the other UNC institutions with smaller funded research programs, have developed areas of specialization in such fields as life sciences, which should have positive implications for supporting a number of the identified emerging industries in North Carolina.

III. CAMPUS CULTURE AND STATE SUPPORT FOR INNOVATION

1. UNC has begun initiatives to address insuring a campus culture at each of its institutions that supports innovation and entrepreneurship. While progress has been made, much work remains to be done.

2. North Carolina has traditionally provided very substantial support for its universities in general and has gained a national reputation as a result. However, a number of competitor states have made more substantial state investments in specific programs aimed at maximizing the partnerships among the state, its universities, and targeted businesses and industries.

8. OTHER PRELIMINARY FINDINGS

While the following do not necessarily fall within the scope of the current project, these findings surfaced during our work and are presented for consideration:

I. FUNDING

1. The funding formula for the NCCCS does not provide a financial incentive for developing or expanding academic programs in the areas of high state need. These programs are often high cost programs. While the UNC funding formula recognizes discipline cost differences, it does not recognize the high start up or expansion costs of such programs.

2. The funding formulas of both NCCCS and UNC need to be updated to reflect the realities of 21st century higher education. Specifically, full formula funding should be provided year round and for all types of delivery (for example, e-learning).

3. The legislature should create a collaborative funding initiative to incentivize more program collaboratives between UNC and NCCCS institutions.

4. With a high school drop-out rate in excess of 40%, North Carolina has a high need for basic skills programs. While the NCCCS has an extensive and successful program, it will not meet the future needs.

5. State budget priorities and shortfalls will require higher education to diversify its resource base.

II. POLICY

1. UNC and NCCCS should work together to define the need for additional higher education sites. First priority should be given to expanding the use of existing facilities (e.g., extension offices; public libraries).

2. Each system should notify the other system of new academic programs that are in development so that possible collaborative programs could be identified early in the process.

3. NCCCS should be immediately removed from the rule-making of the state so as to increase its ability to respond to program needs in a timely manner. All barriers to nimble responses to economic transformation must be eliminated.

4. With leadership from UNC, NCCCS, and DPI, a new state-wide P-16 Council should be formed that includes business leaders and others. Best practices in P-16 should be examined in states such as Maryland and Georgia. States that have recently reinvigorated and expanded their P-16 efforts, such as Ohio, should also be examined. The state-wide P-16 Council should lead to the establishment of Regional P-16 Councils.

5. North Carolina should adapt a program for reciprocal in-state tuition with bordering counties in other states.

6. With the associate degree replacing the high school diploma as an entry level qualification for many occupations, the role of the bachelors degree and particularly the masters degree is changing. The need for the masters may even be proportionately higher than the need for students with bachelors. At the same time, many people with bachelors degrees may seek a specific diploma or certificate from a community college at some point in their careers.

7. North Carolina, like all states, has achievement gaps between its white and Asian students and African-American, Hispanic, and Native American students. Even though African-American and Native American participation rates in college are similar to whites, minority students do not have as high graduation rates for undergraduates nor the participation rates in graduate programs.

8. Current financial aid policies do not adequately address the financial needs of students taking multiple courses in joint programs at different campuses, as well as joint UNC and NCCCS programs.

9. Not all academic program expansions are initiated by UNC based solely on need and existing/projected data; external program initiations can undermine the integrity of the academic program review process.

10. UNC and NCCCS should both develop a "one-stop" access point for business and industry to their respective assets. This should be an electronic portal and each system's should link to the other.

11. There is a history of collaborative policies and agreements for joint academic programs and shared facilities between UNC and NCCCS; these could be expanded.

12. Many UNC, NCCCS, and other facilities exist that could be considered as sites to provide greater access to higher education in North Carolina (both for in-person and e-learning).

ATTACHMENTS

ATTACHMENT 1: State of North Carolina Higher Education System and Economic Development Regions

ATTACHMENT 2: North Carolina Community College System – Summary

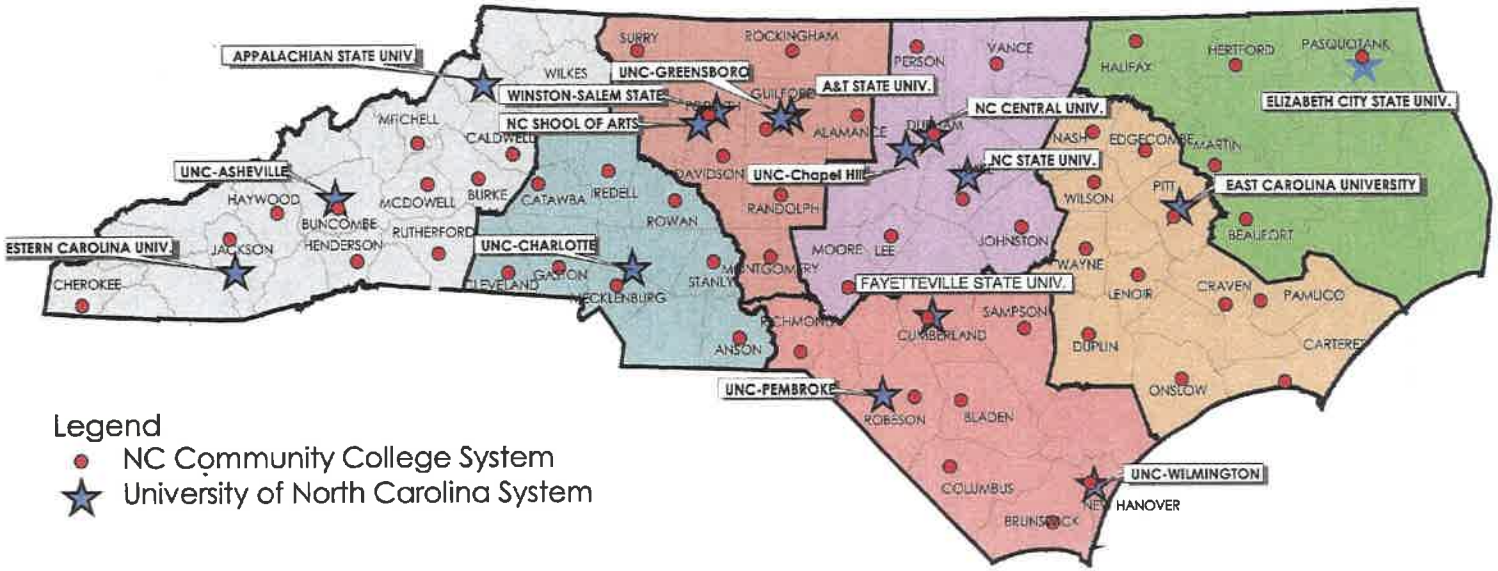
ATTACHMENT 3: University of North Carolina - Summary

ATTACHMENT 4: Issues Regarding Employment Data and Projections

ATTACHMENT 5: Listing of Appendices/URLs

ATTACHMENT 6: Original Language of HB 1264

State of North Carolina
Higher Education System and Economic Development Regions



Legend
- NC Community College System
- University of North Carolina System

Economic Development Regions
- Advantage West
- Charlotte Regional Partnership
- North Carolina's Eastern Region
- North Carolina's Northeast Partnership
- Piedmont Triad Regional Partnership
- Research Triangle Regional Partnership
- North Carolina's Southeast

POLICY & RESEARCH Strategic Planning

Map prepared 12-04

ATTACHMENT 2:

NORTH CAROLINA COMMUNITY COLLEGE SYSTEM - SUMMARY

North Carolina has 58 comprehensive community colleges and one specialized technology center, listed alphabetically below. The system serves all 100 counties. Individual colleges have service areas that may include one or several counties.

COLLEGE	COUNTY	REGION
Alamance CC, Graham	Alamance	Triad
Asheville-Buncombe TCC, Asheville	Buncombe	West
Beaufort County CC, Washington	Beaufort	Northeast
Bladen CC, Dublin	Bladen	Southeast
Blue Ridge CC, Flat Rock	Henderson	West
Brunswick CC, Supply	Brunswick	Southeast
Caldwell CC/TI, Hudson	Caldwell	West
Cape Fear CC, Wilmington	New Hanover	Southeast
Carteret CC, Morehead City	Carteret	East
Catawba Valley CC, Hickory	Catawba	Charlotte
Central Carolina CC, Sanford	Lee	Triangle
Central Piedmont CC, Charlotte	Mecklenburg	Charlotte
Cleveland CC, Shelby	Cleveland	Charlotte
Coastal Carolina CC, Jacksonville	Onslow	East
College of The Albemarle, Elizabeth City	Pasquotank	Northeast
Craven CC, New Bern	Craven	East
Davidson County CC, Lexington	Davidson	Triad
Durham TCC, Durham	Durham	Triangle
Edgecombe CC, Tarboro	Edgecombe	East
Fayetteville TCC, Fayetteville	Cumberland	Southeast
Forsyth TCC, Winston-Salem	Forsyth	Triad
Gaston College, Dallas	Gaston	Charlotte
Guilford TCC, Jamestown	Guilford	Triad
Halifax CC, Weldon	Halifax	Northeast
Haywood CC, Clyde	Haywood	West
Isothermal CC, Spindale	Rutherford	West
James Sprunt CC, Kenansville	Duplin	East
Johnston CC, Smithfield	Johnston	Triangle
Lenoir CC, Kinston	Lenoir	East
Martin CC, Williamston	Martin	Northeast
Mayland CC, Spruce Pine	Mitchell	West
McDowell TCC, Marion	McDowell	West
Mitchell CC, Statesville	Iredell	Charlotte
Montgomery CC, Troy	Montgomery	Triad
Nash CC, Rocky Mount	Nash	East
Pamlico CC, Grantsboro	Pamlico	East

COLLEGE	COUNTY	REGION
Piedmont CC, Roxboro	Person	Triangle
Pitt CC, Greenville	Pitt	East
Randolph CC, Asheboro	Randolph	Triad
Richmond CC, Hamlet	Richmond	Southeast
Roanoke-Chowan CC, Ahoskie	Hertford	Northeast
Robeson CC, Lumberton	Robeson	Southeast
Rockingham CC, Wentworth	Rockingham	Triad
Rowan-Cabarrus CC, Salisbury	Rowan	Charlotte
Sampson CC, Clinton	Sampson	Southeast
Sandhills CC, Pinehurst	Moore	Triangle
South Piedmont CC, Polkton	Anson	Charlotte
Southeastern CC, Whiteville	Columbus	Southeast
Southwestern CC, Sylva	Jackson	West
Stanly CC, Albemarle	Stanly	Charlotte
Surry CC, Dobson	Surry	Triad
Tri-County CC, Murphy	Cherokee	West
Vance-Granville CC, Henderson	Vance	Triangle
Wake TCC, Raleigh	Wake	Triangle
Wayne CC, Goldsboro	Wayne	East
Western Piedmont CC, Morganton	Burke	West
Wilkes CC, Wilkesboro	Wilkes	West
Wilson TCC, Wilson	Wilson	East
NC Center for Applied Textile Technology, Belmont	Gaston	Charlotte

ATTACHMENT 3:

UNIVERSITY OF NORTH CAROLINA - SUMMARY

UNIVERSITY	FOUNDED	STATUS	COUNTY / REGION
Appalachian State University, Boone	1899	Master's I (Comprehensive)	Watauga West
East Carolina University, Greenville	1907	Doctoral/Research-Intensive	Pitt Eastern
Elizabeth City State University, Elizabeth City	1891 HBCU	Baccalaureate	Pasquotank Northeast
Fayetteville State University, Fayetteville	1867 HBCU	Master's I (Comprehensive)	Cumberland Southeast
NC Agricultural & Technical State University, Greensboro	1891 HBCU	Doctoral/Research-Intensive	Guilford Triangle
NC Central University, Durham	1909 HBCU	Master's I (Comprehensive)	Durham Triangle
NC School of the Arts, Winston-Salem	1963	Specialized	Forsyth Triad
North Carolina State University, Raleigh	1887	Doctoral/Research-Extensive	Wake Triangle
UNC Asheville, Asheville	1927	Liberal Arts	Buncombe West
UNC Chapel Hill, Chapel Hill	1789	Doctoral/Research-Extensive	Orange Triangle
UNC Charlotte, Charlotte	1946	Doctoral/Research-Intensive	Mecklenburg Charlotte
UNC Greensboro, Greensboro	1891	Doctoral/Research-Intensive	Guilford Triad
UNC Pembroke, Pembroke	1887 Native American	Master's I (Comprehensive)	Robeson Southeast
UNC Wilmington, Wilmington	1947	Master's I (Comprehensive)	New Hanover Southeast
Western Carolina University, Cullowhee	1889	Master's I (Comprehensive)	Jackson Western
Winston-Salem State University, Winston-Salem	1892 HBCU	Baccalaureate	Forsyth Triad

ATTACHMENT 4:

ISSUES REGARDING EMPLOYMENT DATA AND PROJECTIONS

Many countries and regions, for example, Shanghai, Malaysia, and Germany, develop comprehensive country-wide economic and workforce development plans focusing on the growth of strategic clusters. In North Carolina, there appears to be no comprehensive, statewide, strategic plan or overview of the economic and workforce development needs of the State. Different regions gather data differently, the classification systems differ, and there appears to be no central data depository for the various entities located throughout the state. The quality and consistency of secondary data available in North Carolina makes it difficult to pinpoint precise areas of skill shortages as they are perceived by the employers who are the customers of the state's workforce development and post-secondary education system. During the research gathering phase of our work, significant data discrepancies were uncovered among the State, its regions, and the US DOL's Bureau of Labor Statistics. These discrepancies are a cause for concern and an opportunity.

Specifically, the following issues hinder North Carolina's ability to see clearly economic development and employment opportunities:

1. *The way in which data are cut.* The US Bureau of Labor Statistics (BLS) maps specific occupations into industries, but not necessarily in sectors or clusters. For example, biotechnology workers are spread over a number of occupational categories found in the BLS data.

2. *Challenges with regional data.* The data and economic development strategies for the regions are highly variable in quality, depth, and accuracy, and not sharply enough defined in terms of occupational forecasts. Also, the studies are highly dissimilar in scope and content. Several of the regions had not completed the current visioning process. This led to gaps in the data. Further, the regional forecasts do not tie back to the occupational categories, either in the NCESC or in the BLS because the classifications are different. For example, North Carolina's biopharmaceutical report divides occupations into three broad categories: entrepreneur/leader, R&D, and manufacturing. No such categories (e.g., the needs of the biopharmaceutical sector) exist in the NCESC or USDOL data. What specific occupations fit under those three headings in North Carolina's Biopharmaceutical cluster(s) can only be gathered with primary research. There is a similar problem with the IT industry, as the heading "computing and mathematical occupations" may not include enough occupations found in that industry in North Carolina.

ATTACHMENT 5:
LISTING OF APPENDICES/URLS

APPENDICES

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ATTACHMENT 5:
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Source: RTI calculations based on aggregation of NCESC data

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- Table 3.B.3 North Carolina Occupation Trends 2002-2012: Employment in Production Occupations
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Source: Figure 5.1 Nanotechnology's Probable Business Impact in 2007, Larta, 2003

- Figure 3.B.6. Nanotechnology's Impact on Traditional Industries:

Source:1. Creating a Bio-science Workforce: National Skills Standards for Entry into the Bioscience industry. EDC 1995. Monika Aring and Judith Leff. Funded by the US Department of Labor and US Department of Education. Source 2. Windows on the Workplace 2003: A Training Needs Assessment for the Biomanufacturing Workforce. March 2003. NC Biotech Center Education and Training Program. http://www.ncbiotech.org/pdffiles/goldenleafrpt.pdf

- Table 3.B.9. Analysis of Skills Requirements for Biopharmaceutical Workforce

Source: http://demog.state.nc.us

- Table 3.C.1 Population Forecasts for 2010 by Age
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- Figure 3.C.7. Educational Attainment Levels: *Source: www.ncruralcenter.org/databank/trendpage_education.asp*
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Source: www.census.gov

- Table 3.C.4 North Carolina Educational Attainment, 2004, Percent of Population 25 and Older
  Source: www.census.gov/population/www/socdemo/education/cps2004.html. Tables A, 12 and 14, accessed 4/12/05.
- Table 3.C.5 North Carolina Educational Attainment, 2004, Percent of Population 18 and Older
  Source: www.census.gov/population/www/socdemo/education/cps2004.html. Table14, accessed 4/12/05.
- Table 3.C.6. North Carolina Educational Attainment, 2004, Percent of Population 25 and Older
  Source: www.census.gov/population/www/socdemo/education/cps2004.html. Table14, accessed 4/12/05.

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- Ref. *2005-7 Expansion Budget Request Justification,* page 1, para 4).
- Ref. *2005-7 Expansion Budget Request Justification*, page 1, para 2.)
- *www.ga.unc.edu/student_info/caa*
- Statistical Abstract of Higher Education, which is produced on an annual basis by the UNC. (It is available online and includes data for all higher education institutions in North Carolina.)
- Data from TheCenter at the University of Florida
- Georgia, for example, has created "Centers for Innovation" in targeted areas of research strength and state need. (*See http://www.georgiainnovation.org/* for more details
- California, through its "California Institutes for Science and Innovation" and its "University of California Discovery (See *http://www.ucop.edu/california-*

institutes/about/about.htm and http://uc-industry.berkeley.edu/about/goals.htm for more details.) is investing both in specific areas with the former program.

ATTACHMENT 6:
ORIGINAL LANGUAGE OF HB 1264

Original Language as approved in House Bill 1264:

PART 6. UNIVERSITY SYSTEM AND COMMUNITY COLLEGE SYSTEM JOINT STUDY OF HIGHER EDUCATION STRATEGY

SECTION 6.1. To ensure that the State's citizens are academically prepared and equipped for current job opportunities and jobs of the future in North Carolina's growing knowledge economy, the Board of Governors of The University of North Carolina, in collaboration with the State Board of Community Colleges, shall, within 60 days after this act becomes law, contract with a private consulting firm that has experience in higher education to conduct a comprehensive study of the mission and educational program needs for the University System and the Community College System. The Board of Governors may enter into contracts with consultants for the purposes authorized in this section without complying with the provisions of Article 3C of Chapter 143 of the General Statutes. The study shall include all of the following:

(1) An analysis of demographic, economic, and educational data regarding the needs for higher education programming in the State as a whole, as well as in all geographic and economic regions of the State.

(2) An updated enrollment projection for each System and each institution that includes adult, noncredit, career, and degree program enrollments.

(3) An analysis of current program offerings and majors in undergraduate, graduate, nondegree, and workforce training programs, offered by each institution.

(4) Recommendations as to how the institutions might better serve current and emerging needs related to existing and new programs; opportunities for regional program delivery; enhanced effectiveness and quality that can be achieved via sharing of resources, and program partnerships and collaborations both within and between higher education systems; and opportunities for online program delivery and other distance technology delivery systems.

(5) An analysis of and suggested updates to existing long-range capital plans of both the University and Community College Systems that will address land acquisition and facility needs to support the program recommendations identified in this study, taking into account opportunities for modernization of and new uses for existing facilities.

(6) With regard to the University System, there shall be special emphasis on the development of signature programs for Historically Black Colleges and Universities and the University of North Carolina at Pembroke. In conducting the study, the consulting firm shall take into account that the General Assembly finds the Historically Black Colleges and Universities and the University of North Carolina at Pembroke to be institutions with important historical traditions and equally important contemporary purposes and, as such, are valuable and indispensable assets of The University of North Carolina and the State. The General Assembly intends to encourage the continued growth and development of those constituent institutions and would resist any suggestion to eliminate the historical function and purpose of those institutions.

(7) With regard to both the University System and the Community College System, there shall be an acknowledgement of the existence and importance of a strong liberal arts education foundation and, at the same time, an emphasis on existing and new programs specifically aimed at meeting business, industry, workforce, and career needs of North Carolina in the State's changing and growing knowledge-based economy, taking into account, as appropriate, State and regional economic strategies.

SECTION 6.2. These studies shall be designed to provide information and recommendations that will assist the General Assembly in setting priorities for funding to address the strategic higher education needs of the State. The Board of Governors, the State Board, and their consultant shall periodically report their findings to a higher education programming of the Joint Legislative Education Oversight Committee. The two boards and their consultant shall report the preliminary results of the study to the General Assembly and to the Joint Legislative Education Oversight Committee by April 15, 2005, and shall file a final report and recommendations with the General Assembly and the Joint Legislative Education Oversight Committee no later than December 31, 2005.

SECTION 6.3. The Joint Legislative Education Oversight Committee may create a higher education programming subcommittee to monitor the study authorized in this part.

Technical Correction – the following change was made in Senate Bill 1225, 2004 Technical Corrections Act:

SECTION 51. If House Bill 1264, 2003 Regular Session, becomes law, then the first paragraph of Section 6.1 of House Bill 1264, 2003 Regular Session, reads as rewritten:

"SECTION 6.1. To ensure that the State's citizens are academically prepared and equipped for current job opportunities and jobs of the future in North Carolina's growing knowledge economy, the Board of Governors of The University of North ~~Carolina, in collaboration with the State Board of Community Colleges,~~ Carolina and the State Board of Community Colleges shall, within 60 days after this act becomes law, contract with a private consulting firm that has experience in higher education to conduct a comprehensive study of the mission and educational program needs for the University System and the Community College System. The Board of Governors and the State Board may enter into contracts with consultants for the purposes authorized in this section without complying with the provisions of Article 3C of Chapter 143 of the General Statutes. The study shall include all of the following:".

February 1, 2006

STAYING A STEP AHEAD: HIGHER EDUCATION TRANSFORMING NORTH CAROLINA'S ECONOMY

PRELIMINARY RECOMMENDATIONS

I. INTRODUCTION

Continuing its nationally recognized tradition of being a progressive leader, North Carolina has been examining the role of higher education in its economic future. The catalyst for this examination was the 2004 HB 1264, which called for The University of North Carolina and the North Carolina Community College System, with the assistance of a private consulting firm (Pappas Consulting Group Inc.), "to conduct a comprehensive study of the mission and educational program needs of the two systems." Specifically, the bill called for:

1. An analysis of demographic, economic, and educational data regarding the need for higher education programming in the State as a whole, as well as in all geographic and economic regions of the State.

2. An updated enrollment projection for each System and each institution that includes adult, non-credit, career, and degree program enrollments.

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5. An analysis of and suggested updates to existing long-range capital plans of both the University and Community College Systems that will address land acquisition and facility needs to support the program recommendations identified in this study, taking into account opportunities for modernization of and new uses for existing facilities.

6. With regard to the University System, there shall be special emphasis on the development of signature programs for Historically Black Colleges and Universities and the University of North Carolina at Pembroke. In conducting the study, the consulting firm shall take into account that the General Assembly finds the Historically Black Colleges and Universities and the University of North Carolina at Pembroke to be institutions with important historical traditions and equally important contemporary purposes and, as such, are valuable and indispensable assets of The University of North Carolina and the State. The General Assembly intends to encourage the continued growth and development of those constituent institutions and would resist any suggestion to eliminate the historical function and purpose of those institutions.

7. With regard to both the University System and the Community College System, there shall be an acknowledgement of the existence and importance of a strong liberal arts education foundation and, at the same time, an emphasis on existing and new programs specifically aimed at meeting business, industry, workforce, and career needs of North Carolina in the State's changing and growing knowledge-based economy, taking into account, as appropriate, State and regional economic strategies.

An Interim Report that focused on findings was issued in May 2005. An Updated Interim Report was issued in December 2005 so as to reflect the North Carolina Employment Security Commission's occupational projections through 2012 (the previous report only had 2010 data available). Interestingly, this updating exercise illustrated some of the limitations of such projections since there were a significant number of changes in the high demand occupations and some definitional changes that had an impact (for example, educational levels required for certain employment categories changed in the two sets of projections).

The Updated Interim Report provided the information required in HB 1264 for items 1 (state and regional data), 2 (enrollment projections), and 3 (current academic programs). It also provided background information on items 4 (collaboration and distance learning), 6 (role of HMI's), and 7 (Liberal Arts). Item 5, long-range capital plans, was not included because of the need to complete academic program analysis first.

This "Preliminary Recommendations" report addresses each of the "findings" from the Updated Interim Report. At this stage of the study, these are primarily summarized in the matrix on pages 7-39. The matrix includes the finding, provides a summary recommendation, identifies the responsible party, and specifies a timetable. A number of recommendations suggest processes to enhance further the collaboration between UNC and NCCCS. Other recommendations include suggested statutory changes and appropriation requests.

II. OVERALL PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS

The matrix recommendations are specific to the original findings. As the study has proceeded, however, it has become apparent that the overall conclusions are taking a different form than perhaps originally anticipated. The HB 1264 language seems to anticipate, quite logically, that the study would identify large gaps between the projected job and career needs of North Carolina and the production of graduates by UNC and NCCCS. Further, the language anticipates that these gaps would require that additional academic programs be created, perhaps necessitating mission changes either at the system(s) or institutional levels. Finally, again very logically, the legislative language seems to anticipate that new programs would require new facilities. While some of this may still be true, the overall conclusion to date is that the gaps that are projected to exist are, to a large degree, not of the magnitude to require extraordinary action. Where there are major gaps, specifically in teachers and nurses, the state has already begun major initiatives following comprehensive studies. Also, it should be noted that North Carolina, for many reasons, has the ability to attract in-migration of employees in needed areas.

This overall conclusion is a compliment to both UNC and NCCCS and their regular processes for identifying and responding to employment needs. With some modifications to these processes, as identified in the recommendation matrix, there is every reason to believe that, with continued legislative budgetary support (again, with some recommended modifications), higher education can respond to the future needs for the number of graduates in specific fields. This is true for both traditional jobs and careers and for jobs and careers in the emerging industries identified in the Interim Report. Additionally, the track records of both UNC and NCCCS suggest that they are capable of responding to changing needs that long-term projections may miss. Finally, both UNC and NCCCS appear to have been relatively successful not only in adding new programs (in UNC the additions at the HMI's are particularly noteworthy), but also in preventing the expensive duplication of programs and in sustaining the overall quality of programs. Thus, nothing in the study to date leads to the conclusion that major mission changes are needed with the exception that most UNC institutional missions are not explicit about the economic development role of universities.

Yet while higher education in North Carolina may have the processes in place (with some modifications) to produce (or attract in) the number of needed graduates, there are significant questions about whether it can produce the type of graduates that the 21st Century knowledge economy demands. Employers, especially those in emerging industries, want graduates with "soft skills" or "21st Century skills." By this, they mean graduates who are critical thinkers; graduates who can work and contribute in teams; graduates who have superior communication skills; graduates who can plan and organize; graduates who exhibit professionalism in all that they do; and graduates who can assimilate new technology rapidly. While many of these skills may be by-products of a higher education, a strong case can be made that they ought to be intentional and, to the extent possible, measurable outcomes of a higher education. For example, the general education component of higher education usually is designed around an array of menu courses (a distribution requirement) rather than specified skills and knowledge. The same is true for degree (associate or bachelors) requirements.

This conclusion requires further exploration, particularly for developing recommendations that address teaching methodologies, faculty development, and curriculum redesign.

In addition to the type of graduates required in the future, the study also concludes that the means of delivering education need to be expanded. New technologies offer new possibilities, but the technology infrastructure for both UNC and NCCCS must be robust enough to allow for a significant expansion. This use of technology also has significant implications for faculty development and for creating "hybrid" forms of degrees (partially offered in concentrated in-person mode and partially through distance education, preferably Internet-based). Such hybrid degrees may have implications for ready access to facilities. In many cases perhaps existing higher education facilities (such as extension offices associated with land grant universities) or related facilities (such as public libraries) could play a role.

There are three areas where significant gaps between the number of graduates produced and the projected jobs already exist and may well persist: computer related fields, teaching, and nursing. The computer area presents several challenges. First, the industry is one that changes very rapidly. Second, the demand for employees sees extraordinary swings. For example, the ESC data using 2000-2010 numbers projected a need for 4,830 bachelors graduates a year. However, once the "bust" technology years were included, the 2002-2012 projections fell to 1,770 bachelors graduates. A similar pattern exists for associate degrees in the computing area. The demand for both types of degree are down, yet the gap that remains is still very significant (over 1,000 bachelors degrees, for example). Third, compounding this situation, the production of graduates has declined in both UNC and NCCCS, which is hardly surprising as students monitor job trends quite carefully. Finally, this field appears to lack appeal to women and minorities, both of whom are underrepresented. The demand for graduates with computer skills is reported by the industry to be back on the increase. However, if the domestic market does not respond to the demand, the industry has shown a willingness to outsource functions overseas. All of these factors suggest that this is an area for further study.

The other two significant gap fields, teaching and nursing, are not in need of further study. Both have been studied extensively, and there are a multitude of recommendations, best practices, and funding requests. UNC has set very explicit targets, especially in the teaching area. NCCCS has also begun to play an expanded role in teacher education. There is one fundamental difference between the gaps in the supply of teachers and nurses: the teacher gap is largely a function of the lack of demand (too few students seeking a degree), whereas the nursing gap is largely a function of supply (the demand exists from students but there is an insufficient supply of "slots" in higher education).

The two areas, however, share many similarities. They are both "high impact" fields, meaning that economic development in any community depends on that community having good schools and good healthcare. They both require practicums. They have both traditionally been female dominated occupations. They have both suffered from underrepresentation of minorities. They both attract (and currently depend on) in-migration of employees. They are both professions that have salary and workplace issues.

While the final recommendations will include specific items (such as simplifying and updating scholarship programs), one notion that needs further exploration is the bringing together of these two professions to present a highly targeted, combined legislative agenda. The joint influence of the education and healthcare communities would be powerful indeed, as would bringing together faculty and administrators from both fields.

Another area for a combined effort is the production of faculty by UNC for NCCCS, particularly in certain high demand fields. The health-related professions would be an obvious area for an initial program (especially nursing); however, UNC and NCCCS leadership should develop a comprehensive program that would include student recruitment (including, perhaps, guaranteed employment), student scholarships, an accelerated curriculum, and the creative use of distance learning. Once the program is designed, UNC and NCCCS should present a combined funding request to the North Carolina legislature. Such a program has the potential to make a major impact on the long-term quality of instruction in NCCCS, as well as increasing student access. It also would further advance the relationship between NCCCS and UNC.

III. HISTORICALLY MINORITY INSTITUTIONS (HMI)

As the Interim Report documents (see pp. 107-110), the UNC focused growth initiative has had an extraordinary impact on the HMIs. Their enrollments have increased dramatically; their facilities have been expanded and improved; their academic program arrays have become more extensive; and their research grants and contracts have increased. As the Interim Report concludes: "Other states have attempted to strengthen their HMIs, but it is hard to imagine any program that has been more successful than this one."

With success, however, comes some challenges. Sustaining growth and quality at the recent rates for most of the HMIs may not be possible. The infrastructure, the facilities, and the process for hiring and orienting new faculty may all be feeling some strain. The new academic programs are up and running, enrolling good numbers of students, and creating very positive impacts (especially as most are in high demand fields, including science and technology areas). Yet the program side may also be in need of a period of consolidating the gains by careful program assessment and review.

This need to "catch up" infrastructure, processes, and program evaluation has also to be balanced with the need to maintain momentum and to realize ambitions. The difficulty arising out of this study is that the employment gap data do not provide obvious areas for signature program development for the HMIs. At the bachelors level, all of the HMIs already offer programs in the high demand fields. The masters level offers some possibilities, especially in the specialized science areas (where UNC has launched a funded project for the overall system). Rehabilitation counseling is a masters area with high demand and low supply; only four UNC institutions offer the program, including only one HMI. At the Ph.D. level, this is largely a mission and resources question as the data do not identify many North Carolina specific areas of shortage (with the exception of clinical counseling and school psychologists, and perhaps, nursing).

Professional programs are often sought as "signature programs" by institutions because of their apparent prestige. Again, though, the available data do not make a compelling case for the addition of any new stand-alone professional programs. Certainly, the shortage of pharmacy graduates is significant, especially when the high rates of pharmacy positions currently filled by in-migration are considered. However, UNC has already responded by developing a collaborative program between UNC Chapel Hill and one HMI (Elizabeth City State University); another is under consideration (Winston-Salem State University). These collaborative, joint professional programs could be considered pilots and possible models for additional HMI involvement in professional programs as needed.

Final recommendations for any additional academic programs at the HMIs will need to be made following further discussions with the UNC Office of the President (particularly with its Academic Affairs division) and the institutions, since available data alone do not lead to automatic conclusions.

IV. INITIAL RECOMMENDATIONS ON FINDINGS FROM THE INTERIM REPORT (DECEMBER 2005)

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
Current Educational Environment-NCCCS			
1. The North Carolina Community College System through its 58 colleges and numerous off-campus facilities provides accessible education opportunities for students. Ninety of North Carolina's 100 counties have community college facilities of some sort, approved by the State Board of Community Colleges. (see page 75 of Interim Report)	See Recommendation on p. 37 under Policy #1.		
2. Academic programs are comprehensive at all 58 colleges, ranging from basic literacy education through the first two years of a baccalaureate degree. (see page 75 of Interim Report)	The State Board of Community Colleges should reaffirm that the mission of community colleges in North Carolina is to provide academic programs from basic literacy education through the first two years of a baccalaureate degree and to the statutorily required emphasis on workforce education and training (technical and vocational) and adult education.	• State Board of Community Colleges	2006
3. There is a State Board-approved process colleges use to plan and develop new programs. There is also a State Board policy on terminating low enrollment or inactive programs. (see page 75 of Interim Report)	The State Board of Community Colleges should reexamine its new program approval process to insure maximum nimbleness in responding to the needs of business and industry (see also p.37, Finding #3).	• State Board of Community Colleges	2006
4. Curriculum programs are organized around system-wide standards and include ladder opportunities (i.e., certificate, to diploma, to degree) for students. This gives more students the opportunity to earn a credential and facilitates the transfer of students from one community college to another. (see page 75 of Interim Report)	The NCCCS System Office should continue to monitor and update system-wide standards.	• NCCCS System Office	On-going

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
5. College transfer or liberal arts programs have not negatively impacted the statutorily required emphasis on workforce education and training (technical and vocational) and adult education. For the last five years, college transfer enrollment has consistently been about 22% of total curriculum enrollment. Conversion from the quarter system to the semester system several years ago has not negatively impacted workforce education and training. (see page 75 of Interim Report)	See Recommendation #2.		
6. The basic skills offerings in the community colleges are structured so as to allow progression to the next level within the same institution (i.e., educational ladder). (see page 76 of Interim Report)	The size and availability of basic skills programs should be assessed with the needs of dislocated workers and high school dropouts particularly in mind.	• NCCCS System Office	2006
7. The Community College System provides a significant amount of education and training for business and industry through its continuing education programs. In addition, most of the training for public safety agencies at the local level—fire, emergency rescue, and law enforcement—is provided by community colleges. (see page 76 of Interim Report)	The NCCCS should continue to provide extensive education and training for business and industry and should examine the need for additional skill certification programs.	• NCCCS System Office	2006
8. The BioNetwork initiative, the Community College System's component of North Carolina's focus on biotechnology, has been rapidly organized at the System level and among participating colleges over the past year. Collaboration with UNC and particularly NCSU and NCCU is a key part of this initiative. This collaboration has great potential for both systems and could serve as a model for future initiatives. (see page 76 of Interim Report)	The NCCCS should aggressively pursue additional opportunities to collaborate with UNC on initiatives that respond to the needs of emerging industries in North Carolina (See Recommendation #3, p.36)	• NCCCS System Office • UNC Office of the President	On-going

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
9. The funding process for community colleges is enrollment driven and has a one-year lag. Special funding to start new programs is usually not provided. This will continue to have a negative impact on planning and implementing new programs, particularly high cost offerings that will be needed to support the education and training needs of emerging industries. (see page 76 of Interim Report)	The state should establish a permanent revolving fund to incentivize community colleges to offer new or expanded programs that respond to high need and/or emerging industries. The fund should be in the $2.5-3.0 million range and allocations for each program would be for its initial year (until formula funding takes over). It should be administered by the NCCCS System Office.	• Governor • Legislature	2006 Legislative Session

Current Educational Environment -University of North Carolina			
1. UNC makes its academic program array readily accessible to prospective students. (see page 81 of Interim Report)	UNC should continue to use all means, including electronic, to make information about its academic program availability to prospective students. It may wish to explore efforts to target specific audiences such as displaced workers.	• UNC Office of the President	On-going
2. UNC institutions provide a wide range of academic offerings in all the major, traditional areas. These programs seem to be appropriately distributed across the institutions with relatively clear mission differentiation. For example, UNC includes a School for the Arts and a public liberal arts university (UNC Asheville). (see page 81 of Interim Report)	UNC should continue to encourage significant mission differentiation without inhibiting entrepreneurship. UNC may wish to reexamine each institution's mission to insure appropriate reference to its economic development role.	• UNC Office of the President and UNC Board of Governors	2006
3. UNC institutions all offer a broad range of liberal arts majors. (see page 81 of Interim Report)	See Recommendations #1, 3, 4, 6, pp. 20, 21, 22		
4. UNC should continue its processes to minimize unnecessary and expensive duplication of specialized academic programs. (see page 81 of Interim Report)	UNC should continue its program review process, including its use of external evaluators on key programs, but should also consider proposals that emerge from Recommendation #8b., p.10.	• UNC Office of the President	On-going

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
5. UNC institutions offer extensive academic programs in areas of current high state need. (see page 81 of Interim Report)	See Introduction		
6. UNC appears to offer a reasonable number of low demand academic programs that are desirable for offering a full academic array in the state. (see page 81 of Interim Report)	UNC should continue its annual process of reviewing low production programs and its analysis of the role those programs play in the overall academic program array.	• UNC Office of the President	On-going
7. UNC institutions may not be offering identified academic programs in emerging fields as quickly as some other states, although such programs may indeed be imbedded in existing programs. (see page 81 of Interim Report)	UNC should examine how some states (for example, New York, Texas, California) have packaged, marketed and funded academic programs in emerging fields (such as nanotechnology).	• UNC Office of the President and selected UNC institutional academic leaders	2006
8a. UNC should increase its efforts to expand cooperative degree programs and collaborative programs, both within UNC and NCCCS. These efforts would be accelerated by special incentive funding from the state. 8b. UNC should work with the institutions to implement some modification to the program approval process to allow greater nimbleness in responding to new programs that respond to economic transformation initiatives, especially in emerging areas. Such a modification might include: - creating "incubator" degrees with fast-track approval for an initial period. - Redesign of certain masters and Ph.D.'s in accelerated programs, including use of technology. (see page 81 of Interim Report)	See Recommendation #3, p.36 A group of institutional CAOs should be formed, chaired by an institutional CAO, to produce specific recommendations for modifications to the program approval process. Some of the recommendations may include proposed pilot programs.	• UNC Office of the President as convener only.	Spring 2006