Higher Education Study Committee
Daniel Ravenel, Chair

April 20, 2009

Dear Members of the South Carolina General Assembly:

On behalf of the legislatively appointed Higher Education Study Committee, I am pleased to inform you that the Committee has released its final report, ***Leveraging Higher Education for a Stronger South Carolina: The Action Plan Implementation.***

Members who served with me on the committee included: Mr. J. Boone Aiken, III, Esquire, of Florence; Colonel Claude Eichelberger of Camden; The Honorable Jerry N. Govan, Jr., House District 95, Orangeburg County; Dr. Doris R. Helms of Clemson; Mr. Scott Ludlow of Columbia; Mr. Robert W. Marlowe of Charleston; Layton McCurdy, M.D., of Charleston; and Dr. John E. Montgomery of Columbia.

Our work represents the culmination of efforts that have involved hundreds of committed citizens representing education, the military, government, and business and industry who have committed thousands of thoughtful hours to considering what the collective goals of our higher education system should be and what strategies might be pursued to attain them. The final report builds on the earlier September report of the Committee (*Leveraging Higher Education for a Stronger South Carolina: The Action Plan Framework*), which outlined four goals for higher education and provided the context for the importance of achieving these goals for the future success and competitiveness of South Carolina. The four goals are:

Goal 1: Making South Carolina One of the Most Educated States
Goal 2: Increasing Research and Innovation in South Carolina
Goal 3: Increasing Workforce Training and Educational Services in South Carolina
Goal 4: Realizing South Carolina's Potential Resources and Effectiveness

The Committee's final report provides clear direction for higher education in the Action Plan's six-year time frame by outlining specific strategies and recommendations for achieving the goals. These strategies include implementing now or in the near future those parts of the plan that involve little or no additional expenditure of state appropriations. Information is also provided on the striking payoff for South Carolina if we forge ahead to increase significantly the education levels of South Carolina's citizens.

We are pleased that the Commission on Higher Education will now take the lead in implementing the plan.

For your convenience, an Executive Summary of the report has been delivered to your office. Legislative Printing is providing you with an electronic link to the full report. The full report and other information about the Committee's work may also be accessed at http://www.che.sc.gov/HigherEd_ActionPlan.htm. Should you desire a hard copy of the full report, please contact Ms. Julie Carullo at the Commission on Higher Education at jcarullo@che.sc.gov or 803.737.2292.

I know that Ken Wingate and the rest of the Commission on Higher Education look forward to working with you and your colleagues in the General Assembly during the current and in upcoming sessions to make the plan a reality. Thank you again for the work you do on behalf of the citizens of South Carolina and on behalf of higher education.

Sincerely,

Daniel Ravenel
Chair, Higher Education Study Committee

A Report of the Higher Education Study Committee

Leveraging Higher Education for a Stronger South Carolina

Action Plan Implementation

MARCH 2009

THE HIGHER EDUCATION STUDY COMMITTEE

The Higher Education Study Committee (HESC) was authorized in 2007 with the passage of Proviso 5A.28 in the FY 2007-08 Appropriations Act. The HESC was reauthorized in 2008 with the inclusion of the proviso again (Proviso 6.27) in the FY 2008-09 Appropriations Act.

The HESC includes nine members who were appointed by the Governor, the President Pro Tempore of the Senate, the Speaker of the House of Representatives, and the chairs of the Senate and House finance and education committees. The members are as follows:

Mr. Daniel Ravenel of Charleston – Appointed by the Speaker of the House of Representatives, The Honorable Robert W. Harrell, Jr., and elected by the HESC to serve as Chairman.

Mr. J. Boone Aiken, III, Esquire of Florence – Appointed by Senate Finance Committee Chairman, The Honorable Hugh K. Leatherman, Sr.

Colonel Claude Eichelberger of Camden – Appointed by the Governor of South Carolina, The Honorable Marshall C. Sanford, Jr.

The Honorable Jerry N. Govan, Jr., House District 95, Orangeburg County. – Appointed by former House Education and Public Works Committee Chairman, The Honorable Robert E. Walker

Dr. Doris R. Helms of Clemson – Appointed by House Ways and Means Committee Chairman, The Honorable Daniel T. Cooper.

Mr. Scott Ludlow of Columbia – Appointed by the Governor of South Carolina, The Honorable Marshall C. Sanford, Jr.

Mr. Robert W. Marlowe of Charleston – Appointed by Senate President Pro Tempore, The Honorable Glenn F. McConnell.

Layton McCurdy, M.D., of Charleston – Appointed by the Governor of South Carolina, The Honorable Marshall C. Sanford, Jr.

Dr. John E. Montgomery of Columbia – Appointed by Senate Education Committee Chairman, The Honorable John E. Courson.

The enclosed report, ***LEVERAGING HIGHER EDUCATION FOR A STRONGER SOUTH CAROLINA: ACTION PLAN IMPLEMENTATION,*** is the second of two reports issued by the HESC. It is available online through the S.C. Commission on Higher Education's website at www.che.sc.gov/HigherEd_ActionPlan.htm.

The first report, ***LEVERAGING HIGHER EDUCATION FOR A STRONGER SOUTH CAROLINA: THE ACTION PLAN FRAMEWORK*** was released in September 2008 and is also available at www.che.sc.gov/HigherEd_ActionPlan.htm. ***The Action Plan Framework*** provided an essential structure by describing the goals in depth and detailing benefits, areas of potential emphasis and probable mechanisms for implementation. As such, it provides clear direction for higher education in the Action Plan's six-year timeframe (2009-2015).

The enclosed report, ***The Action Plan Implementation,*** complements the framework with detail about follow-through and specific spheres of action, mechanisms to be employed to reach each goal, the required resources, and the areas of responsibility for success.

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Workforce Competition in a Global Knowledge Economy

Today's global knowledge economy is driven by innovation and requires a highly educated, highly flexible and adaptive workforce. To ensure South Carolina's competitiveness and to realize a prosperous future for South Carolinians, we must act boldly to set high aspirations and we must act now to improve significantly the education levels of our state's citizens. It is imperative that we greatly increase South Carolina's awareness of the importance of higher education to an improved economy and quality of life. Becoming one of the most educated states in the nation will be no easy feat. But we must. Our future economic success and quality of life depend on it.

The strategies outlined in this Action Plan are necessary to reach the overarching aspirational goal of becoming one of the more educated states in the nation by 2030. Through higher education, we must seek opportunities to increase innovation and research as well as provide enhanced workforce development and educational services if South Carolina is to compete successfully with other states and other countries in today's knowledge economy.

The proportion of jobs requiring only a high school diploma continues to shrink, and South Carolinians with a minimal level of education will continue to see wage levels and job stability decline as employers outsource work to other countries or incorporate technology for the completion of the simplest tasks. The availability of a highly skilled workforce is essential to economic prosperity for any city, state, region and/or nation. Education has always been a critical factor in economic development, and today's changing technological landscape has not only increased the level of education needed for most jobs but has also led to a revolution in workforce training. Today, employers minimally expect college-level preparation (certificate or degree) that is based on the ability of an individual to learn continuously as retraining becomes increasingly necessary.

Recognizing the trend toward more knowledge-based jobs, many of the less-educated states such as Texas, Kentucky and Oklahoma have set in motion aggressive plans to sharply increase educational levels and create an environment that enables their citizens to better compete for higher-paying jobs. Other states are also moving swiftly and South Carolina must do the same or risk being left behind.

South Carolina has made great strides over the years in research-based competitiveness through various programs and partnerships among the state's three research universities. However, many states and countries have increased their investment in research and innovation at a more rapid rate – creating a significantly more competitive environment. South Carolina must act now to do more. We must strengthen the state's existing base of activity and funding as well as anticipate new areas of focus if the state is to continue to fully compete, and ultimately to thrive in a knowledge economy.

If we invest now to realize this Action Plan, a study undertaken by the University of South Carolina's Division of Research at the Moore School of Business shows a striking payoff for South Carolina.

- For each dollar the state spends between 2010 and 2030, $11.20 is added to the economy (measured by gross state product).
- Further, after reaching that goal in 2030, each dollar spent by the state boosts South Carolina's economic activity (measure by gross state product) by $25.20.
- The overall effect on South Carolina's economy is considerable – an annual gain for South Carolina after reaching the goal in 2030 of $6.9 billion in total personal income, $7.8 billion in gross state product, and 44,514 additional permanent jobs. These jobs will spread across every region of the state.

This positive economic impact will have the potential to decrease significantly South Carolina's unemployment rate. In addition to the powerful direct benefits to income and employment, increased education levels provide significant secondary benefits including: lower health care costs and lower social costs such as reduced expenditures for incarceration and welfare.

Creating a Stronger, More Competitive Workforce in South Carolina

Armed with the knowledge that South Carolina must prepare to compete in today's knowledge economy on a local and global level, the Higher Education Study Committee worked closely with numerous constituencies to determine what the collective goals of our higher education system should be and what strategies it would take to attain them.

The Committee found that a focused, action-oriented statewide higher education plan is necessary to increase significantly South Carolina's overall competitiveness and provide clear direction for higher education. As the basis of the plan, a six-year timeframe (2009-2015) and four primary goals for higher education were identified:

- **Goal 1:** Making South Carolina One of the Most Educated States
- **Goal 2:** Increasing Research and Innovation in South Carolina
- **Goal 3:** Increasing Workforce Training and Educational Services for South Carolina
- **Goal 4:** Realizing South Carolina's Potential – Resources and Effectiveness

This report identifies several objectives for each of these goals and provides specific recommendations on how to achieve each of those objectives, which are highlighted and briefly summarized below.

Making South Carolina One of the Most Educated States

Although South Carolina exceeds the national level in the number of associate degrees holders, it is still well behind leading states. What's more, South Carolina falls well short of the national average and very far behind national leaders in the proportion of adults (25 and older) who hold graduate/professional and baccalaureate degrees. Nationally, all postsecondary degree holders have higher median incomes and lower unemployment as compared to individuals with only a high school diploma or less, according to the U.S. Bureau of Labor and Statistics.

To help increase the number of adults participating in higher education, while strengthening the K-12 to higher education pipeline, this report outlines several objectives aimed at increasing the education levels of all South Carolinians:

- **Objective 1:** Increase the number of high school graduates who are well prepared for college
- **Objective 2:** Strengthen the transition from high school to college
- **Objective 3:** Increase higher education graduation rates
- **Objective 4:** Increase adult participation in higher education
- **Objective 5:** Attract and retain more graduates

Each objective identified in this report is supported by several recommendations designed to accomplish these objectives and the overarching goal of increasing the numbers of citizens who complete secondary education and are prepared for success through postsecondary education and ultimately employed in a knowledge-based economy.

Increasing Research and Innovation in South Carolina

For South Carolina to be nationally and internationally competitive, the state must increase the number of graduates and develop a creative culture that attracts, develops and retains the most talented people. As new markets and

competitors are created, science and innovation are increasingly leading the global economy. To fully engage in this new economy, South Carolina must develop an infrastructure that supports the transfer of technology from academia to industry as well as provide a foundation so the best innovators and entrepreneurs can build and grow their enterprises.

While South Carolina has created an environment of research-based competitiveness through the Centers of Economic Excellence Program, the Venture Capital Investment Act, the Light Rail fiber network and others, the high degree of focus among the three research universities will continue to serve as a powerful asset in achieving the following objectives, which are aimed at increasing South Carolina's research and innovation opportunities:

- **Objective 1:** Create a culture of discovery
- **Objective 2:** Optimize the process of technology transfer
- **Objective 3:** Enhance research and innovation partnerships among all colleges and universities and among colleges, universities and the private sector
- **Objective 4:** Recruit and retain the brightest innovators

The recommendations included with each objective in this report are necessary to enable South Carolina to become a leader in innovation and research.

Increasing Workforce Training and Educational Services for SC

The proportion of jobs requiring only a high school diploma is rapidly declining, with the result that South Carolinians with a minimal level of education will continue to see wage levels and job stability decline as employers outsource work to other countries or incorporate technology for the completion of the simplest tasks.

Simply put, the state must make rapid changes to increase the number of educated citizens or we will all face a diminished quality of life. In the past, South Carolina has done well in regards to workforce development training for business. However, 85% of new jobs now require some level of postsecondary education. That statistic further emphasizes the need for increased education and training for adults as well as recent high school graduates, if South Carolina wants to expand the capacity and abilities of its workforce to replace retiring workers while providing a workforce for new jobs in growing fields.

Recommendations are aimed at preparing a South Carolina workforce needed for industry sectors that are expected to grow by at least 15% between now and 2016. These sectors include: information; health care and social assistance; utilities; administrative support, waste management and remediation services; educational services; real estate, rental and leasing; and management of companies and enterprises.

To meet the goal of increasing workforce training and educational services, the following objectives are outlined:

- **Objective 1:** Prepare the workforce for economic development cluster needs
- **Objective 2:** Communicate the importance and value of higher education and the action plan to targeted groups
- **Objective 3:** Connect adults to education and training opportunities
- **Objective 4:** Identify or create financial pathways to attain education and training goals
- **Objective 5:** Strengthen higher education services to enhance workforce development
- **Objective 6:** Strengthen the foundations for a world-class scientific and technical workforce

Realizing South Carolina's Potential – Resources and Effectiveness

South Carolina has a well-established accountability system, yet the state has not historically provided adequate funding for colleges and universities. For example, the percentage of state general fund support for higher education in FY 2009 is only about 10.2% of state general funds as opposed to the 14.9% that was received a decade ago. What's more, according to the latest available national data, South Carolina ranks 38th nationally and 15th out of the 16 Southern Regional Education Board states in FY 2007 when it comes to funding higher education. The state's level of support per full-time equivalent student is $5,838 compared to the national average of $6,773. Without adequate support, South Carolina will be unable to encourage the type of innovation and education needed to advance the state's agenda for competitive excellence in a 21st century knowledge-based, high-tech economy. Over the last ten years, as most states have made higher education a priority, South Carolina has ranked 50th in increased support to higher education. Without appropriate funding, South Carolina will continue to trail its neighboring states, and efforts to increase the competitiveness of the state will further weaken.

To fully realize our state's potential, this section of the report addresses the following issues:

- Resources for higher education in South Carolina
- A strong foundation of effectiveness
- Effective management of resources
- Areas of potential for synergy/savings
- Priorities for the future

Conclusion

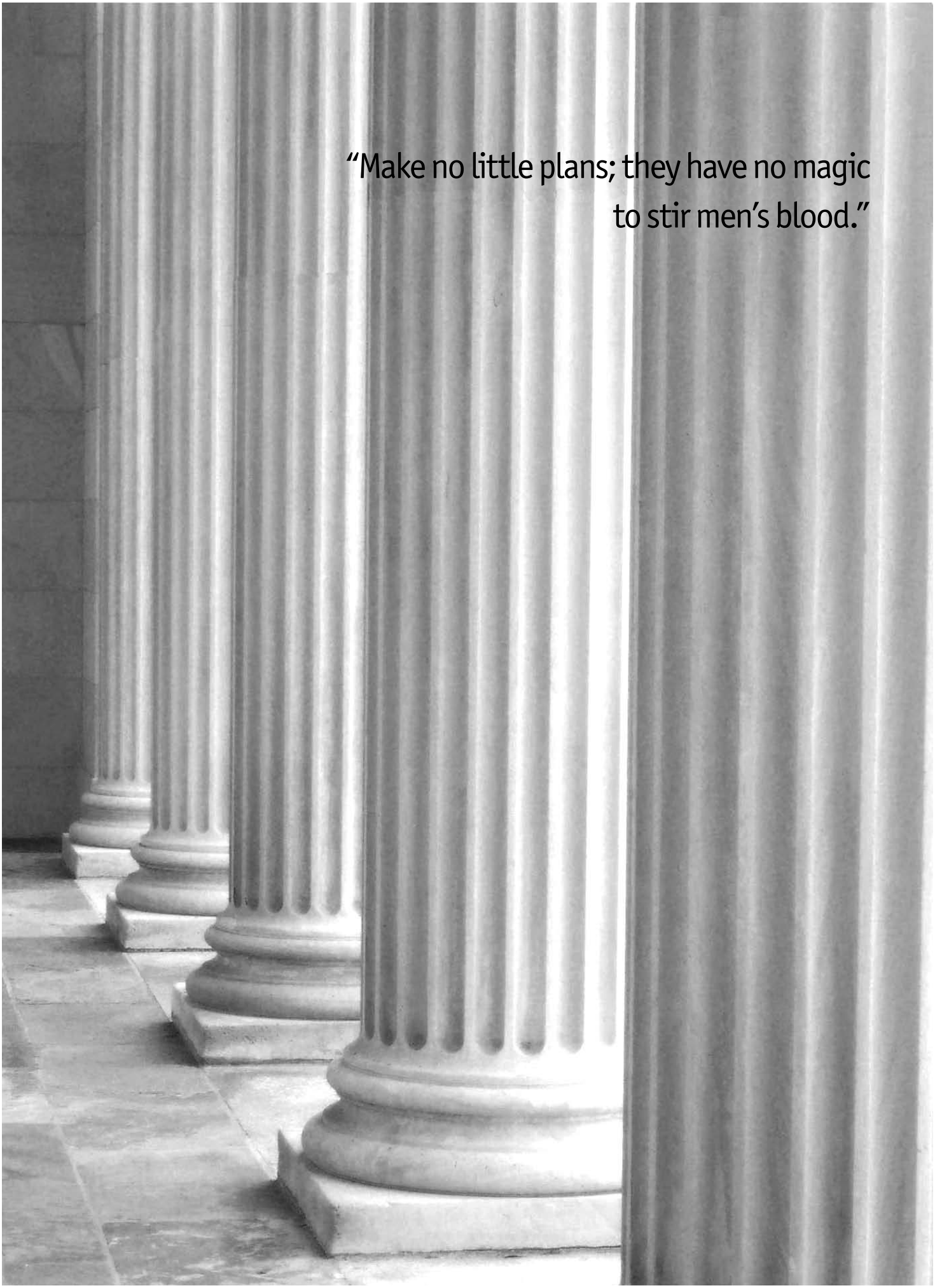
Investing in higher education not only provides key economic and social benefits for all South Carolinians but also strengthens the state's global economic competitiveness, improves income and job security for individuals, helps attract and retain knowledge economy leaders, and offers new opportunities for increased workforce development and services in the new economy.

If we forge ahead and realize the aspirational goal of becoming one of the most educated states by 2030, the payoff for South Carolina described at the outset is worth repeating. The research by the Moore School suggests that for every dollar invested from 2010 to 2030, $11.20 is added to the economy (measured by gross state product) and after 2030, each dollar spent boosts South Carolina's economic activity by $25.20. The estimated annual gains in South Carolina economy after reaching the goal in 2030 are considerable – $6.9 billion in total personal income, $7.8 billion in gross state product, and 44,514 additional permanent jobs. (See Appendix I for additional details.) The benefit does not stop at the direct benefits to income and employment. The positive impact of increasing the education level of South Carolinians also has the potential to decrease significantly South Carolina's unemployment rate and provide powerful secondary benefits including lowered health care costs and lowered social costs such as decreased expenditures for incarceration and welfare. A forthcoming report from the Moore School will provide calculations on these factors as well as by region of the state.

As less educated states continue their aggressive plans to increase greatly educational levels, and highly educated states make higher education an even greater priority, South Carolina cannot afford simply to maintain, or even worse, reduce its support for higher education. B y taking action now, the opportunity for the return on investment for our state's citizens and economy is far too great to ignore.

The current economic climate presents considerable challenges. However, today's economic downturn does not mean that we must stand still. Instead we will need to focus our attention and energies on those activities we can do now to position South Carolina effectively for better times. We must continue to move ahead despite the enormous challenges we are faced with because standing still will mean that South Carolina will only fall further and further behind neighboring states and competing countries around the world.

The time to act boldly is now. Our state and citizens deserve no less.


“Make no little plans; they have no magic
to stir men’s blood.”

Introduction

The planning process used to create this report and the one that precedes it, *Leveraging Higher Education for a Stronger South Carolina: The Action Plan Framework,*[2] has involved dozens of committed citizens representing education, government, business, and industry who have committed thousands of thoughtful hours to considering what the collective goals of our higher education system should be and what strategies might be pursued to attain them. To provide a brief context for this potentially transformative collaboration, a summary of the major steps on the ladder toward the new Action Plan contained in this report may be useful. At the end of the 2007 Session, the General Assembly established the Higher Education Study Committee, whose members were appointed by the Governor and the House and Senate leadership. Chaired by Mr. Daniel Ravenel of Charleston, the Higher Education Study Committee established six expanded subcommittees to ensure broad-based representation from a larger cross-section of stakeholders. These six subcommittees reviewed the following areas: institutional missions, academic programs and planning; enrollment; funding and institutional cost; buildings, facilities and information technology; organization and plan implementation; and scholarships and grants. Collectively, these subcommittees identified four primary goals for higher education:

- **Goal 1:** Making South Carolina One of the Most Educated States
- **Goal 2:** Increasing Research and Innovation in South Carolina
- **Goal 3:** Increasing Workforce Training and Educational Services for South Carolina
- **Goal 4:** Realizing South Carolina's Potential - Resources and Effectiveness

These four core goals as well as priority areas of action are examined in considerable detail in the Higher Education Study Committee report issued in September 2008 entitled *Leveraging Higher Education for a Stronger South Carolina: The Action Plan Framework.* The Higher Education Study Committee then appointed four Task Forces to develop specific recommendations that colleges and universities would be able to implement in the six-year timeframe covered by the new Action Plan. The collective recommendations of these four task forces make up the basis of this report.

Creating the Action Plan

The General Assembly authorized a Higher Education Study Committee to develop and recommend an evolving, multi-year plan for higher education in South Carolina. The Higher Education Study Committee chose to create an action plan because it is short-term, includes specific actions and is clearly connected to the needs of the state. Realizing that a successful plan requires a participatory approach and a broad understanding and support on the part of those who will make the plan work, the Higher Education Study Committee was as inclusive as possible in the process of preparing the two reports describing the action plan: *Leveraging Higher Education for a Stronger South Carolina: The Action Plan Framework* and *Leveraging Higher Education for a Stronger South Carolina: The Action Plan Implementation*.

The Action Plan Framework

The Higher Education Study Committee released *Leveraging Higher Education for a Stronger South Carolina: The Action Plan Framework* on September 15, 2008, with the belief that a focused, action-oriented statewide higher education plan is a necessary bridge to increase significantly South Carolina's competitiveness, realize a prosperous economic future, and enhance quality of life for South Carolina's citizens. *The Action Plan Framework* provides an essential structure by describing the goals in depth and detailing benefits, areas of potential emphasis, and probable mechanisms for implementation. As such, it provides clear direction for higher education in the Action Plan's six-year timeframe (2009-2015).

The Action Plan Implementation

While *The Action Plan Framework* provides the reasoning behind, and the details of, the four goals identified by the Higher Education Study Committee, this report, *Leveraging Higher Education for a Stronger South Carolina: The Action Plan Implementation*, recommends action for the four goals. *The Action Plan Implementation* complements the framework provided in *The Action Plan Framework* with details about follow-through. For each of the four goals, *The Action Plan Implementation* identifies several objectives and provides specific recommendations to achieve those objectives. A reference guide for the recommendations and those that are high priority can be found in Appendix II. In November, a draft of this report was circulated for public comment and regional hearings were held from November 17-21, 2008, and on December 10, 2008.

The Importance of Higher Education

The world economy has changed from one based on labor to one based on knowledge. Such a knowledge economy, with continuous science-based innovation, depends on highly educated, highly flexible, and adaptive individuals. South Carolina, whose percentage of college-educated citizens overall is much less than the national average, must make rapid changes to become more educated or it will face a diminished economy and quality of life. As discussed in The *Action Plan Framework,* South Carolina has a strong educational platform; however, the state needs to do more to be competitive with the best states and countries.

Education has always been a critical factor in economic development. During the 1980s, sharp declines in manufacturing employment and the equally rapid rise of the service sector resulted in declining demand for unskilled workers. As a result, the wages of those with a college education, already relatively high, began to pull away from those with only a high school diploma. Another factor surged to prominence as the knowledge economy replaced the traditional natural resources/unskilled labor-intensive manufacturing economy: science-based innovation. As noted in *The Action Plan Framework,* technology has been a significant factor in economic growth. As new electronic tools were combined with cheap computational power, a much faster rate of technological change began to diffuse throughout society, especially in the United States. The changing technological landscape has not only increased the level of education needed for most jobs but also led to a revolution in workforce training. Fifty years ago, skilled workers were usually trained on the job and rarely needed retraining. Today, employers minimally expect college-level preparation (certificate or degree). The content of that education

1 Cover quote historically attributed to Daniel Hudson Burnham (1846-1912) but now disputed. Emily Morison Beck, ed. *Bartlett's Familiar Quotations* (Boston: Little, Brown and Company, 1980), 661.

2 The full report is available at: www.che.sc.gov/HigherEd_ActionPlan.htm .

no longer centers only around specific skills but instead also focuses on the ability of an individual to learn continuously as retraining becomes increasingly necessary.

South Carolina must take bold steps by following the recommendations of each of the four goals included in this report to strengthen its educational system so that it can compete in the knowledge economy.

Overview of the Four Goals

Goal One – Make South Carolina One of the Most Educated States

Overwhelming evidence reveals that higher levels of education lead to greater prosperity and competitiveness in the knowledge economy. However, South Carolina is well short of the national average and behind the national leaders in the proportion of adults who hold graduate/professional and baccalaureate degrees. At the associate degree level, South Carolina exceeds the national average but is well behind the leading states. The educational level of South Carolinians is especially worrisome given that the importance of higher education in wages and employability is increasing by comparison to a high school diploma at all degree levels. The figure below demonstrates the relationship between educational level and unemployment rates and median income level.

As the figure above illustrates, nationally, all postsecondary degree holders had higher median incomes and lower unemployment rates than those with only a high school diploma, and those with no high school diploma had the lowest median income and highest rates of unemployment in 2007.[3] Additionally, in reviewing this figure, it is worth noting that the median household income in South Carolina is less than the national average ($39,454 compared to $44,334 nationally).[4]

This report identifies several objectives to increase the educational levels of South Carolinians, strengthen the state's K-12 to higher education pipeline, and increase the number of adults participating in higher education:

Objective 1: Increase the Number of High School Graduates Who Are Well Prepared for College

Objective 2: Strengthen the Transition from High School to College

Objective 3: Increase Higher Education Graduation Rates

Objective 4: Increase Adult Participation in Higher Education

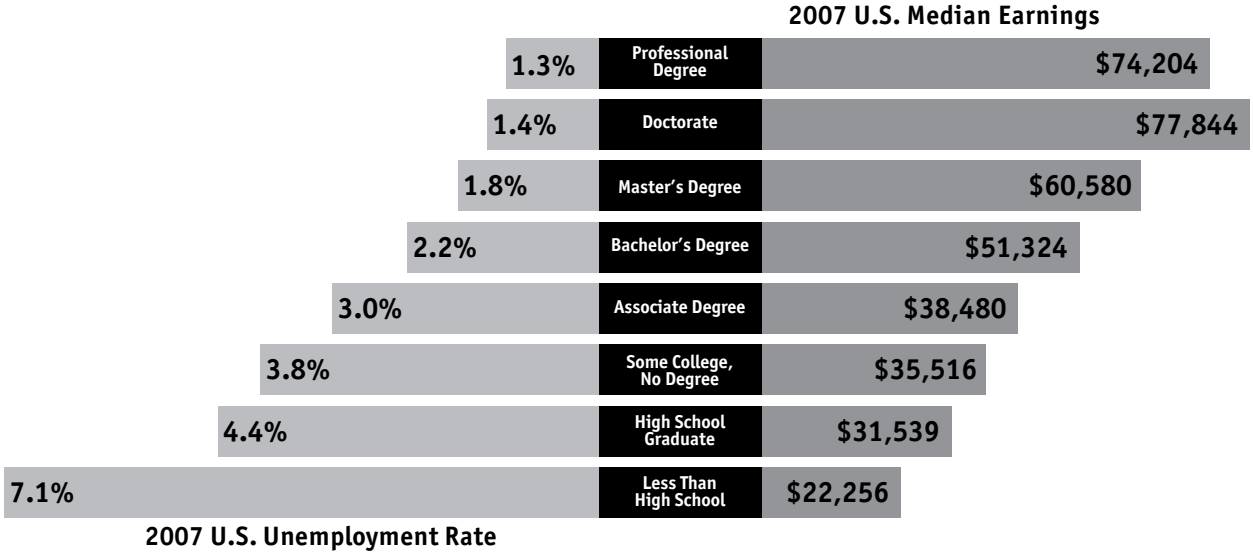
Objective 5: Attract and Retain More Graduates

Each objective provides several recommendations to accomplish the objective and overarching goal of making South Carolina one of the most educated states.

Goal Two – Increase Research and Innovation in South Carolina

Today's economy is driven by innovation, much of which can be traced to research universities. These institutions foster a culture of talent that benefits regions and states because they attract business investment, create new businesses, and sponsor federal and industrial research that create high-value, high-paying jobs. As discussed in the *Action Plan Framework*, South Carolina has taken great strides in research-based competitiveness through the Centers of Economic Excellence Program (endowed chairs), together with a series of well-thought-out measures such as the Research University Infrastructure Grant Program, the Venture Capital Investment Act, the Light Rail fiber network, and more. The high degree of focus and very productive collaborations among the three research universities are also a powerful asset. But many states and nations are increasing their investment in research and innovation at a more rapid rate and with much greater funding, so South Carolina will have to strengthen its existing base of activity and consider new areas of focus if it is to increase its competitiveness.

Figure I. 2007 U.S. Unemployment Rate and Median Earning Rate Based on Degree Attainment Levels.



Source: US Bureau of Labor Statistics, Current Population Survey

3 "Education Pays" Webpage, U.S. Bureau of Labor Statistics Website [Accessed December 3, 2008.] www.bls.gov/emp/emptab7.htm

4 "South Carolina QuickFacts" Webpage, U.S. Census Bureau Website [Accessed December 3, 2008.]http://quickfacts.census.gov/qfd/states/45000.html

To increase research and innovation in South Carolina, this report identifies the following objectives:

Objective 1: Create a culture of discovery

Objective 2: Optimize the process of technology transfer

Objective 3: Enhance research and innovation partnerships among all colleges and universities and among colleges, universities, and the private sector

Objective 4: Recruit and retain the brightest innovators.

The recommendations included in these objectives are necessary to make South Carolina a leader in research and innovation.

Goal Three – Make South Carolina a Leader in Workforce Training and Educational Services

The availability of a highly skilled workforce is the key to economic prosperity for any city, state, region or nation. Higher education is both an individual and a public benefit. For individuals, advantages include higher salaries and benefits; more stable employment; improved working conditions; and improved health and life expectancy. For the public, advantages include increased tax revenues which serve to keep taxes low; reduced need for government support; reduced crime; reduced health care costs; increased civic participation and volunteerism; increased tolerance; and enhanced mastery of technology. These benefits of higher education can be maximized by connecting education and training to the existing and developing economy.

South Carolina has a lower level of labor force participation (63.8% vs. 66% nationally) with the deficit being primarily in the older population.[5] Additionally, 85% of new jobs require some level of postsecondary education.[6] Such data support the need for an emphasis on increased education and training for adults while South Carolina prepares a workforce sufficient both for replacing retiring workers (replacement jobs) and providing a workforce for growing fields (new jobs).

In addition to the recommendation included in Goal One regarding increasing adult participation in higher education, workforce development training for business is an area where the state has had great success and can do more. The recommendations included in this Goal will help South Carolina provide the workforce training and services needed to prepare adults for employment in the knowledge economy where the businesses and industries that depend on and are created by research, innovation, and escalating advances in technology increasingly choose locations based on the workforce, not on the presence of physical and natural resources or even on tax structures. Specifically, the recommendations included in this report will help South Carolina prepare the workforce needed for the sectors expected to grow by at least 15% between 2006 and 2016. These sectors include: information; healthcare and social assistance; utilities; administrative support and waste management and remediation services; educational services; real estate and rental and leasing; and management of companies and enterprises.[7]

To make South Carolina a leader in workforce training and educational services, this report identifies the following objectives:

Objective 1: Prepare the Workforce for Economic Development Cluster Needs

Objective 2: Communicate the Importance and Value of Higher Education and the Action Plan to Targeted Groups

Objective 3: Connect Adults to Education and Training Opportunities

Objective 4: Identify or Create Financial Pathways to Attain Education and Training Goals

Objective 5: Strengthen Higher Education Services to Enhance Workforce Development

Objective 6: Strengthen the Foundations for a World-class Scientific and Technical Workforce

Goal Four – Realize South Carolina's Potential - Resources and Effectiveness

This Goal highlights the need to make sure that adequate resources exist to make the Action Plan successful while at the same time ensuring that documented institutional effectiveness continues to be a priority for colleges and universities. South Carolina has a well-established accountability system but has not historically provided adequate funding for colleges and universities. For example, in terms of state support, if only funding from state sources is included, the percentage of state support in FY 2009 is 10.2% of the state's appropriated funding compared to 14.9% received a decade ago. This change represents a significant decrease in support.

This Goal identifies several recommendations that are intended to increase the funding for higher education, provide routine and predictable capital funding of colleges and universities with a portion of funding directed at eliminating maintenance needs, and create a more accurate picture of higher education funding. Another recommendation recognizes the successful partnerships established by the Partnership Among South Carolina Academic Libraries (PASCAL), an academic virtual library that is an exemplar of an initiative that is improving and increasing coordination and collaboration in higher education, and calls for its full funding.

To realize South Carolina's potential, this report addresses the following issues:

- Resources for Higher Education in South Carolina
- A Strong Foundation of Effectiveness
- Effective Management of Resources
- Areas of Potential for Synergy / Savings
- Priorities for the Future

Strengthening Higher Education in South Carolina

The discussions of the four goals that follow provide recommendations that will strengthen higher education in South Carolina. The actions recommended are necessary because South Carolina must become one of the most educated states, increase research and innovation, and increase workforce development and educational services if it is to compete with other states and countries in the knowledge economy.

5 *2007 South Carolina labor market and economic analysis report,* South Carolina Department of Commerce (2008). www.sccommerce.com/docdirectory/ResearchFolder/Labor%20Market%20and%20Economic%20Analysis%20Report%20-%20South%20Carolina%202007.pdf .

6 Governor's Workforce Education Task Force (2001). *Pathways to prosperity: Success for every student in the 21st century workplace.*

7 South Carolina Department of Commerce (2008).

Goal One

Make South Carolina One of the Most Educated States

Overview

There is overwhelming evidence, nationally and internationally, that higher levels of education lead to greater prosperity and competitiveness in the knowledge economy. In this context, it is a great concern that South Carolina is well short of the national average and very far behind the national leaders in the proportion of adults (aged 25 and older) who hold graduate/professional and baccalaureate degrees. For example, the U.S. average for holders of graduate and professional degrees is 9.9%, compared with 7.9% in South Carolina (for a state rank of 36).[1] At the associate degree level, South Carolina (7.9%) barely exceeds the national average (7.4%) but is well behind the leading state, North Dakota (11.2%).

Table 1.1 below illustrates the degree attainment levels of South Carolina residents aged 25 and older as compared to the nation and the leading states:

Table 1.1.
Degree Attainment Levels of Residents Aged 25 and Older

	S.C.	vs. U.S.	vs. Leader
Graduate/Professional	7.9%	9.9%	15.7% (MA)
Baccalaureate	14.9%	17.1%	22.4% (CO)
Associate	7.9%	7.4%	11.4% (ND)
Overall educated adults (Associates and above)	30.7%	34.4%	44.6% (MA)

Source: 2005-07 American Community Survey, U.S. average for 50 states

South Carolina's position is especially worrisome given that the importance of higher education in wages and employability is increasing with respect to degree attainment (including certificates that are not formal degrees but nonetheless significant indicators of ability). The state is largely an importer of college-educated talent relative to the numbers of college degrees awarded.[2] While recruiting necessary human capital helps meet the current needs of the state's economy, South Carolina must advance at every degree level to remain competitive and afford better opportunity for its citizens. According to *Foundations for the Future: Higher Education in South Carolina, South Carolina* has significant deficits in the educational levels necessary for successful life and work in the 21st century.[3] The 2003 study also noted: "[S]ignificant disparities exist in South Carolina in education attainment and performance by race, gender, income, and between urban and rural populations."[4] Furthermore, the study also cited that "a strong relationship [exists] between low education attainment and quality of life indicators in South Carolina, in areas like per capita income, health, the environment for young children, and crime."[5] The report concludes that South Carolina must significantly increase the percentage of younger citizens who complete secondary education and are prepared for postsecondary education and/or employment in a knowledge-based economy.

1 2005-07 American Community Survey3-year Estimates, U.S. Census Bureau Website. [Accessed January 14, 2009.] http://factfinder.census.gov/servlet/DatasetMainPageServlet?_program=ACS&_submenuId=&_lang=en&_ts
Census population and educational attainment statistics for adults 25 years and over.

2 Jones, D. and Kelly, P., *The Emerging Policy Triangle: Economic Development, Workforce Development and Education (2007).*

3 McGuiness, A. and Novak, R. *Foundations for the Future: Higher Education in South Carolina* (2003). www.che.sc.gov/ExecutiveDirector/Foundations_%20Incl_ExecSum-rev042304.pdf. This report was prepared by the National Center for Higher Education Management Systems and the Association of Governing Board's Center for Public Trusteeship and Governance.

4 *Foundations for the Future,* iii.

5 *Foundations for the Future*, iii.

One needs only look at South Carolina's neighboring states for a highly instructive lesson on the price the state has paid for its failure to give early support to increased levels of higher education attainment for its citizens. In 1960, South Carolina's per capita income was 48th in the U.S., while North Carolina and Georgia ranked 45th and 42nd respectively. In the subsequent four decades, North Carolina and Georgia emphasized higher education as a cornerstone of their economic development strategies, with the result that in 2007, North Carolina had risen to 36th and Georgia to 38th. South Carolina, which did not make higher education as high a priority during that time, ranked 47th in 2007.[6] It is no wonder that many states, most visibly Kentucky, are widely following the North Carolina and Georgia examples by using higher education as a vehicle for economic transformation.

South Carolina must increase the educational attainment levels of its citizenry by generating more graduates (both traditional and non-traditional) and attracting graduates from other states. Given the transition to a knowledge-based economy and increasing globalization, South Carolina needs not only to be nationally competitive but also internationally competitive. The recommendations contained in this report represent the Higher Education Study Committee's effort to provide a clear pathway to create a more educated population in South Carolina.

Setting an Aspirational Goal

South Carolina's aspirational goal for 2030 is to be among the top states in persons holding at least a bachelor's degree.[7] Setting the goal at this high level is designed to inspire South Carolinians to compete with the best. The Action Plan will describe the activities necessary in the first stages of this twenty-one year period (2009-2030); subsequent planning efforts will adjust and revise as necessary.

While data sources available at this point do not permit the development of precise numbers, the magnitude of the challenge is clear: achieving the aspirational goal contained in this report will mean adding significant numbers of degree holders. If South Carolina is to be in the top 15 states, more than 170,000 degree holders are needed to move the state from its current percentage of those holding the baccalaureate or above from 23% to 29%, the level of the 15th ranked state.[8] The two primary sources for the required increase are the traditional K-12 to higher education pipeline and the adult pipeline.

The Traditional Pipeline

South Carolina graduates about 38,000 students from high school each year.[9] Natural population growth is not expected to increase this number significantly over the next 10-12 years, meaning that increases in traditional college students will have to come from some combination of improved high school graduation rates and higher college-going rates.[10]

Since South Carolina's college-going rate of 67% is among the highest in the country, it will be difficult to attain significant increases in the short-term. There are many widely varying estimates of the high school graduation rate, but by most accounts South Carolina's rate ranks comparatively low nationally and is therefore a more likely candidate for near-term change (and as noted elsewhere, there are significant efforts already underway).

Here are some rough estimates: increasing the numbers of South Carolina high school graduates entering college by about 20% would yield some 6,900 additional entrants per year assuming the percent attending college in-state holds steady at 90%. Over the aspirational goal period of 21 years, this increase would yield some 57,000 new baccalaureate degree holders, or 113,000 short of the target of 170,000.

The final mechanism to be considered for the traditional pipeline would be to increase college graduation rates. Currently, about 56% of those entering college obtain a baccalaureate degree within six years. If that percentage were increased to 70% (a very high number in the national context) assuming no changes in South Carolina's high school graduation rate, the number of degrees granted on average each year of the plan would be increased by 2,200.

In summary, if we project: 1) a stable population of young people; 2) a sharply higher number of students entering college from high school; and 3) a significant improvement in the percentage of students earning a degree, South Carolina will meet about 61% of its need over the 21-year period. Another way of looking at this issue is that South Carolina will be 67,000 degrees short or the equivalent of a county the size of Darlington County, South Carolina.

The Adult Pipeline

The other major source of graduates that must be considered is that of non-traditional college students or what will be referred to in this document as the Adult Pipeline. This category is not as easy to understand as the traditional pipeline since there is not a system that allows for clear progression for these students. Some rough calculations follow.

In Fall 2007, the state's public colleges and universities enrolled about 38,000 persons 25 years of age and older who were degree-seeking undergraduates.[11] This enrollment represents just 3% of the approximately 1.4 million South Carolinians 25 years of age and older who have just a high school diploma or some college but no degree. The number of enrolled adults (persons 25 years and older) who earned bachelor's degrees in FY 2006-07 was just under 2,800. This number represents 14% of the 20,103 bachelor's degrees awarded in FY 2006-07 at public and independent institutions. Significant focus on both enrolling and graduating more adults will be absolutely essential to closing South Carolina's higher education gap.

In conclusion, a rough analysis of the available data shows that in order for South Carolina to compete effectively in the knowledge economy, sharp improvements in the traditional K-12 to higher education pipeline must occur. However, absent concurrent and dramatic improvements in the non-traditional (adult) pipeline, it will be impossible to close South Carolina's higher education gap.

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6 Bureau of Economic Analysis. Table SA1-3: Per capita personal income tables at the state level. Data extracted from online resource at: www.bea.gov.

7 Because the Baccalaureate is consistently granted across states, it is the standard measure. South Carolina should expect comparable progress in Associate's degrees.

8 Based on 2005-07 Census American Community Survey data South Carolina's population twenty-five and older has at least a bachelor's degree. That ranks South Carolina 40th nationally. The national average is 27%. The top state, Massachusetts, is at 37.1% while Hawaii at 28.6% ranks 15th. Considering current ACS population estimates, to reach the national average SC will require a minimum of 119,000 additional persons twenty-five and older holding at least a bachelor's degree. To reach 29%, or the approximate level of Hawaii, translates to at least 170,000more degrees.

9 *Knocking at the College Door: Projections of High School Graduates by State and Race/Ethnicity, 1992 to 2022*, Western Interstate Compact for Higher Education (WICHE), March 2008.

10 *Ibid.* SC estimated 38,221 high school graduates in 2009-10 with an expected decrease to 37,834 in 2020-21.

11 Enrollment at independent and proprietary institutions would make numbers somewhat higher; however, complete data for these institutions are not available at present.

Outline of Section Recommendations

There are several key areas in which South Carolina must work to increase its educational levels: 1) the traditional K-12 to higher education pipeline; 2) the higher education experience; 3) the vast number of adults who lack degrees or advanced certificates; and 4) the numbers of highly educated people who choose to locate in South Carolina.

Recommendations intended to increase the flow in the K-12 to college pipeline fall into several categories: Academic Preparation and Relevance, Transitions from High School to College, and Affordability.

Academic Preparation and Relevance: The recent EEDA legislation (Personal Pathways to Success™) contains a series of reforms that are intended to improve preparation and relevance; this legislation builds on and complements efforts of colleges and universities with schools around the state. **Objective 1: Increase the Number of High School Graduates Who Are Well Prepared for College** consists of a series of recommendations designed to attract students to higher education while providing them with a high school education that is purposefully designed and sufficiently rigorous to prepare them to meet the challenges they will face when they pursue higher education at any level.

Transitions from High School to College: The transition from high school to college is often more difficult than expected or necessary and can create a barrier to achievement and completion in higher education. **Objective 2: Strengthen the Transition from High School to College** contains recommendations which, if implemented, will allow for more seamless transitions from high school to college. In addition, the recommendations call for greater cooperation, collaboration, and consistency among the state's institutions of higher education, thereby allowing for easier transfer and greater availability of programs.

Affordability: As a consequence of historically low levels of state support, higher education in South Carolina is very expensive for students and their families. Investments in merit scholarships have helped many parents and students pay for college and have also helped to retain students in state. Unfortunately, the state's financial aid portfolio is not balanced between need and merit, with the result that many students from poor families cannot afford to attend college. Yet much of South Carolina's increased participation must come precisely from such families. Adequate funding for higher education is included as a recommendation in **Objective 3: Increase Higher Education Graduation Rate.**

The higher education experience affects graduation rates, student academic accomplishments, and student transfers between institutions, among other issues. South Carolina is already a national leader in university graduation rates, but improvements are in everyone's interest. Achieving higher educational levels will require mechanisms to increase graduation rates. The recommendations in **Objective 3: Increase Higher Education Graduation Rate** cover transfer and articulation policies, information systems, university-based limits of degrees to 120 credit hours where possible and appropriate, alternative delivery methods, and increased integration of business needs in program creation.

The adult to higher education pipeline is another critical part of any initiative which seeks to increase the numbers of degree holders in the state. More than 500,000 South Carolinians over the age of 25 are without a high school diploma. More than 900,000 South Carolinians have a diploma but no higher education, and more than 500,000 of the state's citizens have some college but no degree.[12] These nearly 2 million people account for close to half of the state's population. Bringing a significant number of these individuals into the knowledge-based economy will require an array of actions, including: flexible formats; low-cost, multiple providers; no-fail competency-based testing; and certificates that build confidence and provide assurances to employers. The recommendations in **Objective 4: Increase Adult Participation in Higher Education** include these and other suggestions aimed at this critical population.

Finally, a way to increase educational levels is to retain in the state as many graduates as possible while at the same time attracting graduates from other states and nations. Retaining graduates (already a relative strength of South Carolina's higher education institutions) and attracting educated outsiders are the subjects of **Objective 5: Attract and Retain More Graduates**. These recommendations emphasize the need to partner with industry to create a financial and cultural environment which will attract top intellectual talent to the state.

Beginning in the twentieth century, the United States, largely in response to demands from employers, began raising the required number of years of schooling. The expectation stood at about the 9th grade in 1900 and had gradually reached that of a high school diploma by around 1940. Economists believe that this rapid increase in educational levels was the principal source of the United States' world-leading economic growth during the first seven decades of the twentieth century.

The Race between Education and Technology: The Evolution of U.S. Educational Wage Differentials, 1890 to 2005.

12 American Community Survey 2007, U.S. Census Bureau Website. [Accessed September 30, 2008.]

Objective 1: Increase the Number of High School Graduates Who Are Well Prepared for College

As noted in *The Action Plan Framework,* South Carolina ranks 48th among the states in the percentage of ninth graders who graduate from high school in four years and then directly enter higher education.[13] As a result, South Carolina has engaged in a number of significant recent reforms in K-12 education, including the Education and Economic Development Act (EEDA) of 2005. Among the many positive outcomes expected is significant improvement in the state's high school graduation rate.

Despite low high school graduation rates, South Carolina ranks fourth nationally in the percentage of high school graduates who go on directly to college.[14] Therefore, if the state wants to increase its educational levels, it must begin by increasing high school graduation rates and strengthening the K-12-to-higher education pipeline. *The Action Plan Framework* identifies three areas of emphasis in the K-12-to-higher education pipeline: (a) academic preparation and relevance, (b) affordability, and (c) aspiration.[15]

In terms of academic preparation and relevance, the recent EEDA legislation, also known as Personal Pathways to Success™, contains a series of reforms that should improve both preparation and relevance. However, more needs to be done to prepare students for college-level coursework since "college-eligible" is not the same as "college-ready." The state must focus on aligning high school and college curricula to better prepare students for college.

Additionally, as a consequence of historically low levels of state support, higher education in South Carolina is comparatively expensive for students and their families. The state must increase operating funding for institutions as well as need-based financial aid for students and make students more aware of the opportunities available to finance higher education.

Furthermore, many families, particularly those who are economically disadvantaged, do not really believe that college is a feasible option for their children. Raising aspirations—increasing the belief that children can go to college and succeed—is a critical part of the state's effort.

"Every 26 seconds a student drops out of school. In total, over 1.2 million students a year—one-third of our students overall—are leaving high school without having earned a diploma. And far too few of those who do graduate are adequately prepared for college and careers. The Bureau of Labor Statistics reports that at least two-thirds of all new jobs—and virtually all high paying jobs—will require at least some postsecondary education. To not be prepared for this eventuality is to close the door on many attractive, family-sustaining jobs in high growth sectors."

"Graduating ALL Students with a High School Diploma That Counts" Achieve, 2008

Supporting Actions in Process

The Education and Economic Development Act (EEDA)

- Focuses on the need to increase the number of high school graduates who are well-prepared for college and addresses the promotion of seamless transitions from high school to college;
- Calls for more articulation agreements between school districts and public institutions of higher education in South Carolina to provide seamless pathways for adequately prepared students to move from high school directly into institutions of higher education;
- Supports increased dual/concurrent enrollment or offering college courses to high school students;
- Calls for the coordination of the study of the content and rigor of high school courses in order to provide a seamless pathway to postsecondary education;
- Encourages long-term planning in high school to provide increased contact between students, their families, and guidance counselors by employing a new electronic tool to facilitate the creation of individualized graduation plans; and
- Allows for the use of career clusters so that students explore career opportunities and related coursework to enhance the relevance of their high school experience.

State-Funded and Institutionally-Funded Financial Aid Programs

- Provide incentives to pursue higher education, including Palmetto Fellows, HOPE, LIFE, need-based grants, the Lottery Tuition Assistance Grant Program, Tuition Grants Program, institutional grants, scholarships, and Work Study.

The SC Gaining Early Awareness and Readiness for Undergraduate Program (SC GEAR UP)[16]

- Designed to increase the number of low-income students who are prepared to enter and succeed in higher education by offering a variety of enrichment, information, family, and experiential programs.

The Higher Education Awareness Program (HEAP)

- Targets eighth grade students and their families by providing information about college preparation and funding.

College Access Programs

- Provides students with academic or other experiences to help them acclimate to college life (e.g., TRIO programs[17]; dual/concurrent enrollment; college information and counseling; and other outreach programs).

13 *The Action Plan Framework,* 16.

14 "College-Going Rates of High School Graduates - Directly from HS for the year 2004," National Center for Higher Education Management Centers Information Center Website (State Higher Education Policymaking and Analysis) (2007). www.higheredinfo.org/dbrowser/index.php?submeasure=63&year=2004&level=nation&mode=graph&state=0.

15 *The Action Plan Framework,* 2.

16 GEAR UP is a national grant program sponsored by the U.S. Department of Education which supports early college preparation and awareness activities for rural and low-income students and ensures that students are prepared to take advantage of postsecondary opportunities. Currently CHE is implementing a six-year, multimillion-dollar GEAR UP grant to the state of South Carolina. In addition to the state GEAR UP program, the U.S. Department of Education also provides GEAR UP funding for local partnership programs. At present, there are five GEAR UP local partnership grants in South Carolina: The Citadel GEAR UP, Claflin University GEAR UP, Lancaster County School District GEAR UP, South Carolina State University GEAR UP, and Richland County School District Two GEAR UP. U.S. Department of Education Website (Last updated September 12, 2008) www.ed.gov/programs/gearup/index.html .

17 TRIO offers a comprehensive set of services through several different programs, each targeted at a specific group of individuals from the sixth grade through adulthood. Services and activities include academic tutoring, cultural enrichment, financial aid and admissions counseling, and student mentoring.

Recommendation 1.1. Implement compulsory high school attendance until the age of 18 or high school graduation.

Several states have compulsory attendance laws that require students to stay in school until the age of 18.[18] If South Carolina were to enact such a policy, the state would retain more students. By extension, increased matriculation along with expanded early and/or middle college programs could better prepare these students for college. Preeminent labor economists Joshua D. Angrist and Alan B. Krueger conducted a study which determined that "students who are compelled to attend school longer by compulsory schooling laws earn higher wages as a result of their extra schooling."[19] Furthermore, the study found, "[T]he estimated monetary return to an additional year of schooling for those who are compelled to attend school by compulsory schooling laws is about 7.5 percent."[20] While compulsory high school attendance to the age of 18 would be costly because it would require more teachers, more physical facilities, and funding for the number of students in question, the possible benefits which could result from those students earning higher incomes (such as increased tax revenue and decreased use of social services) makes compulsory attendance until the age of 18 a worthy endeavor.

According to Dr. David Conley of Education Policy Improvement Center, college-ready students demonstrate the following:

- **Deep understanding of and facility applying key foundational ideas and concepts from the core academic subjects**
- **A strong grounding in the knowledge base that underlies the key concepts of the core academic disciplines**
- **Mastery of key concepts and ways of thinking found in one or more scientific disciplines**
- **Comfort with a range of numeric concepts and principles**
- **Reading and writing skills and strategies sufficient to process the full range of textual materials encountered in entry-level college courses and to respond successfully to the written assignments required in such courses**
- **Ability to accept critical feedback**
- **Ability to study independently and with a study group**
- **Ability to interact successfully with a wide range of people**

***Redefining College Readiness,* 2007**

Recommendation 1.2. Use and promote the *Knowledge and Skills for University Success* standards as a common standard of college readiness.

Not all high school teachers understand the level of preparation required of their students for college success.[21] At the March 31, 2004, meeting of the Advisory Committee on Academic Programs (ACAP), the Committee voted unanimously to endorse the *Knowledge and Skills for University Success* standards from the *Understanding University Success* report[22] so that high school faculty members, guidance counselors, principals, and students would be able to understand with some precision what constitutes preparation for collegiate-level work. The *Knowledge and Skills for University Success* standards addresses college preparation as more than acquiring content knowledge because it involves developing contextual skills and awareness including critical thinking and problem-solving skills and developing effective academic behaviors, study habits, and habits of mind such as intellectual openness, inquisitiveness, and precision and accuracy. Using the *Knowledge and Skills for University Success* standards, the state should focus on improving college readiness through strengthened K-16 cooperation and communication as advocated in both *Understanding University Success* and *Redefining College Readiness*.[23]

End-of-courses tests and high school exit examinations should be aligned with these standards. In addition, by using common college readiness standards, high schools could better align end-of-course tests, the high school exit examination, and other assessments of student ability with placement exams used by postsecondary institutions. Such assessments could enable schools to address learning gaps prior to graduation and therefore reduce the need for remediation.

Recommendation 1.3. Identify a common, statewide assessment that high school students can take to identify and remedy gaps in their preparation for college.

Colleges and universities will work together to identify an existing or develop and implement a new common diagnostic assessment for high school students so that they, their parents, and their teachers know how to improve students' preparation for college.[24] Students should take such an assessment during the sophomore and/or junior years so they can engage in more intense preparation for college during the senior year, if needed. Strategies to use the senior year of high school to prepare students for college better should be developed since the best college readiness preparation occurs before students enter college. The intent of this recommendation is to enhance the usefulness of existing assessments rather than to expand their number.

Faculty will work collaboratively to compare the content of postsecondary placement exams and K-12 exit standards and assessments to determine if better alignment is possible to enhance college readiness.[25]

[See also Recommendation 1.16.]

18 According to the Education Commission of the States, as of June 2007, these states are: California, Connecticut, Hawaii, Kansas, Louisiana, Nebraska, New Mexico, Ohio, Oklahoma, Oregon, Texas, Utah, Virginia, Washington State, and Wisconsin. See: www.schoolengagement.org/TruancypreventionRegistry/Admin/Resources/Resources/131.doc .

19 Angrist, Joshua D. and Alan B. Krueger, "Does Compulsory School Attendance Affect Schooling and Earnings?" *The Quarterly Journal of Economics*, Vol. 106, No. 4 (November 1991), 1010.

20 Angrist, 981.

21 Sanoff, Alvin P, "A Perception Gap Over Students' Preparation," *Chronicle of Higher Education* (March 10, 2006), B9. http://chronicle.com/weekly/v52/i27/27b00901.htm.

22 *Understanding University Success*, Center for Educational Policy Research (2003). http://cepr.uoregon.edu/UUS_Complete.pdf.

23 Conley, David T. (Educational Policy Improvement Center), *Redefining College Readiness* (March 2007). www.epiconline.org/files/pdf/Redefining_College_Readiness.pdf.

24 Venezia, Andrea and Michael W. Kirst, "Inequitable Opportunities: How Current Education Systems and Policies Undermine the Chances for Student Persistence and Success in College," *Educational Policy*, Vol. 19, No. 2, 283-307 (2005). http://epx.sagepub.com/cgi/content/abstract/19/2/283.

25 *Inequitable Opportunities*, 283-307.

Recommendation 1.4. Create a South Carolina College Access Network (SC CAN) as a statewide network of local community-based college access programs.

In a highly collaborative effort, the state will create a college access network which will support "college going communities" through volunteers, donors, parents, teachers, school counselors, K-12 and postsecondary education, civic and faith organizations, and businesses.[26]

The creation of these "college going communities" will involve a broad range of existing and new college access programs, college access related events, donors, and youth- and adult-serving programs in rural and urban regions throughout the state that encourage all individuals to meet their highest potential through education, thereby enhancing the quality of their lives and strengthening the regional economy.

One unique aspect of the South Carolina's College Access Network will be a system of "higher education docents"—community leaders who will volunteer to help transform student, parent, and public appreciation of the importance of higher education to an improved economy and quality of life.

As a comprehensive network of college and workforce programs to encourage access, awareness, and academic/work skills preparation, SC CAN will "tie the threads" of several existing program efforts – from small, grassroots community programs to larger statewide programs – to promote educational enrichment, mentoring, and career exploration for youths and adults. Through combining resources and information, SC CAN will empower South Carolina families to make informed decisions to achieve their educational and lifetime goals.

[See also Recommendation 1.6.]

Recommendation 1.5. Develop a funding mechanism to expand and enhance offerings for college credit during high school.

The state will develop targeted funding for programs for students to earn college credit during high school in order to broaden the number of institutions and students who can participate in such programs. According to one study, high school students who take college courses subsequently perform better in college than those with no history of dual enrollment course-taking.[27] According to the article: "[D]ual enrollment gives students practice at doing college-level work while receiving support from collaborating high school and college instructors."[28] As such, dual enrollment can be used as an "on ramp" to postsecondary education to increase the pool of historically underserved students who are ready for college and to provide realistic information about the knowledge and the skills needed to succeed in postsecondary education.[29] Currently, the only funding source is the Lottery Tuition Assistance program, available only to students who attend two-year institutions.

While dual/concurrent enrollment should be used as a tool to engage students who might not otherwise go to college, the state should also place an equal emphasis on the expansion of Advanced Placement (AP) and International Baccalaureate (IB) options.

Recommendation 1.6. Develop a marketing campaign to promote college attendance and completion.

The state will develop a highly visible and adequately funded marketing campaign (and enter appropriate information on the new EEDA student web portal) which promotes college attendance, comparable to those of other states.[30] The state has access to all the professionally developed materials from participating states in the Southern Regional Education Board's "Go Alliance" program. Such a marketing campaign should not only aggressively sell the need to attend college, but it should also increase awareness about higher education opportunities, make students aware of what is needed to go to college, including academic preparation and cost information, and create a college-going culture.

[See also Recommendations 1.4, 1.40, and 3.8.]

Recommendation 1.7. Create outreach programs to target ninth graders.

Colleges and universities will develop outreach programs that target ninth grade students since ninth grade is an extremely important transitional year. More students fail ninth grade than any other, thus "creating what is known as the ninth grade bulge—and drop out by tenth grade—contributing to the tenth grade dip."[31] Outreach programs need to target at-risk students and should focus on preventing these students from dropping out and encouraging them to aspire to higher education.

Many teacher recruitment programs mentioned in Recommendation 1.8 are administered by South Carolina's Center for Educator Recruitment, Retention, and Advancement (CERRA). CERRA's purpose is to provide leadership in identifying, attracting, placing and retaining well-qualified individuals for the teaching profession in the state. In doing so, CERRA responds to changing needs for teachers from underrepresented populations, in critical subject fields, and in under-served geographical areas in South Carolina.

[See: www.cerra.org .]

Recommendation 1.8. Produce more and better prepared teachers in all critical needs areas, including more male and minority teachers.

In order to have better prepared students, South Carolina must produce more and better prepared teachers. In doing so, the state should focus on the areas identified as critical.[32] The state and institutions should also expand pre-collegiate teacher recruitment programs such as Pro-Team, Team9REACH, and Teacher Cadets. The state

26 College access networks are community-based, non-profit organizations designed to increase the number of students who pursue higher education. Such organizations usually have a particular focus on low income, underrepresented, first generation college students. For example, the National College Access Network (NCAN) improves access for these students by "helping a network of state and local college access programs that provide counseling, advice, and financial assistance; sharing best practices among the network; providing leadership and technical assistance; helping communities create new college access programs, and advocating for public policy in support of the students our programs serve." National College Access Network Website (Last updated July 15, 2008). www.collegeaccess.org/NCAN/ItemPage.aspx?groupid=9&id=9.

27 Hoffman, Nancy, Joel Vargas; and Janet Santos (Jobs for the Future). *On Ramp to College: A State Policymaker's Guide to Dual Enrollment* (2008), 7. www.jff.org/Documents/OnRamp.pdf.

28 *On Ramp to College*, 2.

29 *On Ramp to College*, 2.

30 Examples of such marketing efforts include "Go Higher Kentucky" see: www.gohigherky.org/ and the "College Foundation of North Carolina" see: www.cfnc.org/.

31 *Easing the Transition to High School: Research and Best Practices Designed to Support High School Learning*, National High School Center (eds., Kennelly, Louise, Maggie Monrad, and National High School Center at the American Institutes for Research) (July 2007), 2. www.betterhighschools.org/docs/NHSC_TransitionsReport.pdf.

32 The critical needs areas for the 2008-2009 school year are: agriculture, all middle level areas, art, business education, dance, Early Childhood Education, English/Language Arts, family/consumer science, music, French, German, industrial technology, Latin, mathematics, media specialist, physical education, science (all areas), Spanish, special education (all areas), speech and drama, speech therapist, and theatre. See: www.scstudentloan.org/criticalsubjectareas.aspx .

should increase grant and scholarship opportunities in programs such as Teaching Fellows and the Program for the Retention and Recruitment of Minority Teachers for those interested in becoming teachers.

The state and institutions must do more to encourage and enable males and minorities to enter the teaching field. The state and institutions should expand programs such as "Call Me MISTER"[33] and create new programs aimed at attracting males and minorities into the teaching profession. In addition, more programs like USC's Diverse Pathways are essential to encourage students in two-year institutions to pursue teacher education.

[See also Recommendation 2.4.]

Recommendation 1.9. Increase the amount of information shared with high schools concerning how their students perform in college.

Currently, colleges report back to high schools only first semester grade point averages. However, more information, such as grades in courses tracked over a longer period of time, will be shared in order to track trends and make informed decisions, especially concerning college preparatory curriculum. The state needs to fund transcript exchange among higher education institutions and electronic transmission of data for students enrolled in colleges and universities. Additionally, funding should be provided to expand the electronic records exchange system in order to send data back to high schools. This feedback would allow for electronic analysis of student performance.

Recommendation 1.10. Restore matching funding and expand services for HEAP, GEAR UP, and other related early awareness and readiness programs.

The state must strengthen guidance and support for students and help make them aware of the requirements needed to be successful in postsecondary education through the expansion of programs such as the Higher Education Awareness Program (HEAP) and the Gaining Early Awareness and Readiness for Undergraduate Program (GEAR UP).

Seventy-seven percent of high school students believe that obtaining a high school diploma means that they have at least learned the basics, while only 33% of professors believe the same.[34] A better job needs to be done in communicating the requirements and skills students need to be successful in higher education. The state will target first-generation and low-income students who need information about college, assistance in understanding how and when to begin preparing for college, and help completing college applications.[35] Overall, more opportunities need to be provided for all students—not just higher-performing students—to learn about college.

Recommendation 1.11. Continue to support EEDA initiatives, including dual/concurrent enrollment, transfer and articulation, college course alignment, and other related projects.

With its focus on better preparing students for higher education, the EEDA needs the continued support of the state's higher education institutions and continued if not expanded funding.

Objective 2: Strengthen the Transition from High School to College

South Carolina must do more to ensure that strongly integrated state and local policies, systems, and programs are in place to assist students so they may move seamlessly from high school to higher education. According to a recently-released report[36] from the Southern Regional Education Board (SREB):

> When states achieve an effective system of student transitions from high school to college and careers, they will enjoy improved high school completion rates; improved college preparedness; higher postsecondary enrollments; reduced college remediation rates; and improved student persistence toward employer certifications, associate's degrees and bachelor's degrees.[37]

Furthermore, according to national expert Dr. David Conley of the Educational Policy Improvement Center (EPIC) at the University of Oregon: "An aligned K-16 system is one with clear, sequential expectations for students at each level. These expectations are designed to prepare students for success in postsecondary education, the workplace and society."[38] To prepare students for postsecondary success and to increase students' aspirations for higher education, South Carolina must focus efforts to ease the transition from high school to college. The EEDA (Personal Pathways to Success™) focuses on creating seamless transitions through educational pathways; however, South Carolina must do more to strengthen transitions from one educational level to the next.[39] Many state higher education plans

"However complex students' attendance patterns, the principal story line leading to degrees is that of content. What one learns is what one studies, and what one brings to economic and community life. The story starts in high school, but merely crossing the bridge to college or community college doesn't mean the story is over. Furthermore, the bridge is not always aligned with the road on the other side."

The Toolbox Revisited: Paths to Degree Completion from High School Through College
U.S. Department of Education, 2006

33 According to the Call Me MISTER website: "[T]he mission of the Call Me MISTER National Initiative is to increase the pool of available teachers from a broader more diverse background particularly among the State's lowest performing elementary schools." Student participants for this program are "largely selected from among under-served, socio-economically disadvantaged and educationally at-risk communities." See: www.callmemister.clemson.edu/ .

34 "Reality Check 2000," *Education Week* Vol. 19, Issue 23, (February 16, 2000), S1-S8. www.edweek.org/ew/articles/2000/02/16/23parc3.h19.html.

35 A similar policy is recommended in *Deciding on Postsecondary Education* (National Postsecondary Education Cooperative, 2007). http://nces.ed.gov/pubs2008/2008850.pdf.

36 Bottoms, Gene, and Marna Young, *Lost in Transition: Building a Better Path from School to College and Careers* (2008), iv. This report synthesizes the major conclusions reached from "a series of 15 state-level forums [including one held in South Carolina] aimed at identifying ways to foster collaboration between secondary and postsecondary education systems and build successful transitions from high school to college and careers" (iv).

37 Bottoms, iv.

38 "South Carolina Course Alignment Project: Project Rationale," Educational Policy Improvement Center Website (2008). www.epiconline.org/south_carolina/project_rationale.
The South Carolina Course Alignment Project (SC CAP) is a statewide project initiated by the South Carolina Commission on Higher Education and led by national expert Dr. David Conley of the Educational Policy Improvement Center (EPIC) at the University of Oregon.

39 For information about *South Carolina Personal Pathways to Success*, see: www.palmettopathways.org/EEDA2/default.aspx .

(e.g., Georgia, Kentucky, New Jersey, North Carolina, Ohio, Oklahoma, Tennessee, Texas, Virginia, and Washington) focus on strengthening the transition from high school to college. Many of these states include objectives and strategies to develop collaboration between and among state educational institutions to facilitate student transition.

Supporting Actions in Process

South Carolina Course Alignment Project (SC CAP)[40] [component of EEDA[41]]

- Focuses on aligning secondary and postsecondary courses in English, math, and science;
- Provides explicit information on the content and skills necessary for postsecondary success in order to improve student preparation for college coursework;
- Creates clear pathways between high school and college coursework and reduces curriculum redundancy between high school and college; and
- Defines more clearly and shows in exemplar documents what high school and college work is expected to be in math, science, and English and enables entry-level college courses to be calibrated to the appropriate cognitive challenge level–neither too high nor too low.

College Readiness Preparation Programs (provided by most, if not all, institutions)

- Provide tutoring, coaching, academic learning centers, math and writing labs, mentoring, computer-assisted instruction, etc.

College Access Programs (provided by most, if not all, institutions)

- Provide early exposure to college through initiatives such as TRIO programs, dual/concurrent enrollment, college information and counseling, early and middle college programs, etc.

Summer Transition Programs

- Provide opportunities for students to acclimate to college learning, usually during summer school, by earning college credits, orienting to campus life, and reviewing skills necessary for success in college.

Teacher Cadet Programs

- Recruit talented young people into the teaching profession through a challenging introduction to the field of education taught as a high school class for which college credit is usually offered.

Recommendation 1.12. Promote more rigorous high school coursework.

According to the report *Diploma to Nowhere,* 59% of college students enrolled in remedial courses indicated that their high school courses were easy and nearly half would have preferred more rigorous coursework in order to be better prepared for college.[42] This report also reveals that a conservative analysis of data on college students in 2004 shows that 43% of all students at public two-year institutions and 29% of all students at public four-year institutions have enrolled in a remedial course.[43] In order to prepare these students better, the state needs to create higher expectations and require all high school students to take a rigorous college preparatory curriculum in order to graduate prepared for postsecondary education and work. In addition, all students must be provided with access to a rigorous, advanced curriculum such as AP, IB, and other courses, and, more importantly, be encouraged to enroll in advanced courses, including dual/concurrent enrollment courses.

Recommendation 1.13. Align college course prerequisites with high school graduation requirements and sequence undergraduate general education requirements so that they are linked with appropriate high school senior-year courses.

The senior year must be a time of intense preparation. South Carolina should eliminate early dismissal and should align high school graduation requirements with college prerequisites and sequence undergraduate general education requirements so that they are linked with appropriate high school senior-year courses. Students should be required to take rigorous courses, especially mathematics and science courses, throughout high school, including during the senior year, to prepare for the general education requirements of higher education institutions.[44] In addition, senior projects, capstone courses, workplace internships, and specially designed college transition courses should be offered. The State Department of Education should conduct a study to examine whether block scheduling[45] provides optimal preparation for college in terms of continuous, sequenced instruction, particularly in disciplines such as mathematics and foreign language, which are developmental and build on prior learning.[46]

[See also Recommendations 1.17 and 3.26.]

Recommendation 1.14. Improve high school course-taking patterns and monitor results.

District administrators and high school staff, in cooperation with college faculty, should reevaluate the content of college-oriented curriculum to ensure that high school courses are focused on the rigorous skills needed for college. South Carolina students who take the recommended college

40 See www.epiconline.org/south_carolina http://www.epiconline.org/south_carolina for more information about the South Carolina Course Alignment Project.

41 EEDA focuses on the need to increase the number of high school graduates who are well-prepared for college. One component of the Act addresses the promotion of seamless transitions from high school to college: "The advisory committee [ACAP], in collaboration with the Department of Education, shall coordinate work to study the content and rigor of high school courses in order to provide a seamless pathway to postsecondary education" (S.C. 59-59-210).

42 *Diploma to Nowhere*, Strong American Schools (2008), 4. www.edin08.com/uploadedFiles/Issues/Issues_Pages/DiplomaToNowhere.pdf.

43 *Diploma to Nowhere*, 4.

44 According to the 2007 ACT *High School Profile Report*: "11% of the cohort took less than three years of math courses. Of these students, 21% were college ready. 17% of the cohort reported taking the minimum core (Algebra I, Algebra II, and Geometry). 15% of these students were college ready. In comparison, 55% of the students who advanced beyond minimum core were college ready." ACT High School Profile Report, ACT (2007), 4. www.act.org/news/data/07/pdf/National2007.pdf.

45 The South Carolina Department of Education recognizes the following block scheduling options: strictly 4x4 semester block (classes meeting approximately 90 minutes daily for one semester); strictly A/B (classes meeting approximately 90 minutes every other day all year); 4x4 semester block with modifications; and A/B with modifications. "High School Scheduling Survey" Webpage. South Carolina Department of Education website. http://ed.sc.gov/agency/Accountability/Data-Management-and-Analysis/old/research/ScheduleSurvey.html.

46 According to the report *High School Reform Strategies: A Summary of Research and Implications* (South Carolina Department of Education), "[H]igh schools that adapt a block schedule need to raise graduation requirements. [High Schools That Work] sites that made the greatest gains in achievement in 1998 and 2000 were the sites that had gone to a block schedule and had raised their graduation requirements to 26-28 credits. The schools making the greatest gains were those that required four years of math and science along with either an academic or a career concentration." *High School Reform Strategies: A Summary of Research and Implications*, South Carolina Department of Education Website (2004). http://ed.sc.gov/agency/Innovation-and-Support/Innovation/old/grants/documents/HighSchoolReformStrategies2004.pdf.

preparatory curriculum perform better in college.[47] According to a report issued by ACT, a rigorous, college-oriented curriculum puts students on a trajectory aimed toward college, from grades nine through 12. This curriculum is especially important for minority and low-income students, who have not always been provided access to challenging content.[48] Encouraging minorities and low-income students to take rigorous, college-oriented classes should help them achieve higher scores on standardized tests such as ACT and SAT as well as perform better in gate-keeping courses when they enter college.

Recommendation 1.15. Expand and enhance student transition programs to reduce repetition of courses or course content and attrition.

This expansion and enhancement should include a variety of accelerated learning options such as AP, IB, dual/concurrent enrollment, early and middle college programs, and early intervention programs in addition to HEAP and GEAR-UP. For example, the state could develop a program similar to Washington State's Running Start Program,[49] through which 11th and 12th grade students are eligible to take college courses at Washington's community and technical colleges and at five eligible four-year institutions. Students earn high school and college credits for specific courses and do not pay tuition.[50] Because Running Start students are able to earn college credit during high school, there are considerable benefits both to the state and the student, including reduced costs and the opportunity to graduate from college earlier.[51] In 2005-2006, Running Start saved Washington taxpayers $43.8 million.[52] Furthermore, in comparison to their peers, Running Start students complete more of the courses they take with better grades.[53]

Recommendation 1.16. Develop statewide policies for assessing college readiness levels.

South Carolina's two-year public colleges will adopt a common assessment and determine a common score for student placement into courses which apply to academic programs of study including those leading to certificates, diplomas, or degrees. Students scoring at or above this level will not be placed into developmental courses. For college transfer courses, input will be solicited from public and independent four-year institutions with respect to establishing the common placement score. This goal could be accomplished by establishing appropriate statewide cut scores or score ranges using a common instrument such as ACT's COMPASS/ASSET, which was adopted by the SC Technical College System in 2007.[54] In addition, higher education institutions, in collaboration with the South Carolina Department of Education, will identify or develop an appropriate assessment instrument to measure proficiency in life and physical sciences.

[See also Recommendation 1.3.]

Recommendation 1.17. Foster a college-going culture in high school by developing and implementing activities such as senior seminars.

Colleges and universities will work with school districts to foster and actively promote an integrated college-going culture to ease the transition from high school to college. For example, high school senior seminars will be designed with the four facets of college readiness in mind: (a) key cognitive strategies; (b) key content; (c) academic behaviors; and (d) contextual skills and awareness. These seminars can be designed for any subject area and do not necessarily need to include college-level material because their main focus will be on key issues within the discipline and investigate them in depth.[55]

Another approach to foster a college-going culture could be similar to the approach used by Michigan, which uses national models such as College Summit.[56] College Summit focuses on transition by targeting high-achieving, low-income students who often lack many of the resources and information available to their more affluent classmates when applying to college. Such an approach includes courses in test preparation, college visits, and application guidance.[57]

[See also Recommendation 1.13.]

Recommendation 1.18. Create a P-20 council.

Many efforts in South Carolina target improving secondary-to-postsecondary transitions. In addition to these efforts, the state must create and fund a formal council to focus on the definition and execution of a policy agenda to achieve an integrated system of education that encompasses pre-kindergarten through postsecondary education in order to increase student achievement and improve economic outcomes.

South Carolina is one of only a few states that do not have a formal P-16/P-20 council. Kentucky was among the first states in the nation

47 According to the South Carolina Department of Education: "South Carolina students who took the core academic courses recommended by ACT had an average score of 20.1 for 2007. Nearly 40 percent of the state's students did not take the core courses and scored an average of 18.5, about a point-and-a-half lower." ("South Carolina High School Seniors Raise ACT Scores for Fourth Consecutive Year," *South Carolina Department of Education News* (August 15, 2007). http://ed.sc.gov/news/more.cfm?articleID=810.

48 *On Course for Success: A Close Look at Selected High School Courses That Prepare All Students for College*, ACT (2005). www.act.org/research/policymakers/reports/success.html.

49 According to Washington State's Office of Superintendent of Public Instruction, the Running Start Program was initiated by the Legislature as a component of the 1990 parent and student "Choice" Act (Chapter 9, Laws of 1990, 1st Ex. Sess.). It is intended to provide students a program option consisting of attendance at certain institutions of higher education and the simultaneous earning of high school and college/university credit. Both 11th and 12th grade students can participate in Running Start at the public's expense. See: www.k12.wa.us/RunningStart/default.aspx.

50 *Running Start: 2005-06 Annual Progress Report*, [Washington] State Board for Community and Technical Colleges (December 2006), 1. www.sbctc.ctc.edu/docs/education/assess/0506_runningstart_report.pdf.

51 Reindl, Travis, *Hitting Home: Quality, Cost, and Access Challenges Confronting Higher Education Today,* Lumina Foundation for Education (March 2007), 6. www.makingopportunityaffordable.org/wp-content/file_uploads/Hitting_Home_030107.pdf.

52 *Running Start: 2005-06 Annual Progress Report,* 4. During 2005-2006, 10,284 full-time students participated in the program.

53 *Running Start: 2005-06 Annual Progress Report,* 1.

54 One distinct advantage of adopting COMPASS/ASSET for use statewide is the service available from ACT which allows institutions to send their data to, and subsequently receive free, analyses back from ACT.

55 Conley, David, "The Challenge of College Readiness," *Educational Leadership* (April 2007), 4. www.epiconline.org/files/pdf/The%20Challenge%20of%20College%20Readiness.pdf.

56 Cunningham, Alisa F., Wendy Erisman and Shannon M. Looney (Institute for Higher Education Policy), *Higher Education in Michigan: Overcoming Challenges to Expand Access* (March 2008), 29.

57 College Summit uses courses and workshops to assist in the postsecondary planning process. See College Summit Approach Website: www.collegesummit.org/about/the-college-summit-approach.

to bring K-12 and higher education together through a P-16 council.[58] Currently, 40 states have P-16 or P-20 councils which address concerns about P-12 to higher education alignment.[59] According to the Education Commission of the States, the issue of P-16/P-20 Councils matters because "[e]stablishing a P-16 or P-20 council sets a formal expectation and a venue for collaboration across early learning, K-12 and postsecondary providers," and "a focused agenda can reduce the likelihood that time and effort will be spent on duplicative efforts."[60] Moreover, establishing statistical P-16 or P-20 performance goals, as opposed to more generalized statements of expectation, has been found to provide additional focus, accountability and validation for P-16 and P-20 reform efforts.[61]

South Carolina should establish a task force to determine how best to create and fund a dedicated P-20 council in which members focus on issues of intersecting interest across sectors such as college readiness, minority enrollment and assessment, teacher recruitment and retention, science and mathematics pipeline, and other important issues. The task force should investigate effective models in other states and ensure that the proposed council does not duplicate work of other committees. The task force should draw on resources such as the Education Commission of the States' database of P-16/P-20 councils. This resource reveals that similar councils in other states include members from the following stakeholder groups: Early Childhood Education; K-12 Education (State Superintendent of Education and other representatives); Postsecondary Education (representatives from coordinating or governing board and representatives from both public two- and four-year institutions, as well as independent institutions); Government (Governor, chair of the House Education and Public Works Committee, and chair of the Senate Education Committee); and Business (State Chamber of Commerce and other business representatives). Such a composition would place the council in a position to effect policy changes and should facilitate the adoption and implementation of P-20 policies.

Recommendation 1.19. Create a longitudinal data system.

The state should create a longitudinal data system to strengthen P-20 coordination through expanded data collection and analysis. The state must extend its current capacity to share and use student achievement and employment data from preschool through college and beyond. Efforts must also be made to ensure that all private information and data are safeguarded.

A Longitudinal Data System (LDS) federal grant received by the SC Department of Education (SCDE) three years ago was targeted to improve state-level data systems primarily at the K-12 level. These funds are also being used for the implementation of an electronic transcript project statewide (high school to college primarily but not college to college). In support of these projects, a common student identifier has been created in the K-12 sector. The unique identifier can be transported to the higher education institutions and used for tracking purposes.

"Having the right members at the table can help ensure the coherency and continuity of a council's efforts, and increase the likelihood that a council's recommendations will find their way to enactment in policy and implementation by state agencies. Alternatively, alignment efforts can fall short of their potential as a result of "Goldilocks Syndrome," when too few, too many or not the right group of people are at the table. The problem is exacerbated when council members' roles and responsibilities are not clearly specified at the outset, or when council members do not meet on at least a quarterly basis."

Education Commission of the States
November 2008 Policy Brief

Conversations are occurring at the regional and national levels for states to talk with each other about P-20 data initiatives and the lessons learned from successful implementations of such data systems. The first round of K-12 grants awarded by the U.S. Department of Education went to 14 states, including South Carolina. Subsequent grants are being awarded to states where there is evidence of secondary and postsecondary data collaboration in progress.

Additionally, the state will participate in an initiative sponsored by the Southern Regional Education Board (SREB) and the Data Quality Campaign (DQC) to bring together K-12, postsecondary, and P-20 council education policy and information system leaders to discuss both the potential and the challenges of linking K-12 and postsecondary education data systems to inform better educators and policymakers with high-quality student-level longitudinal data.

Recommendation 1.20. Expand statewide college application and financial literacy initiatives for high school students to assist in the preparation for college and the transition from high school to postsecondary education.

The state must strengthen current programs[62] and develop future programs to make high school students and their parents more knowledgeable about critical steps for entering college including knowledge of academic and admissions requirements, college selection, and finding financial aid to attend college. Expansion of statewide college access initiatives should also provide every graduating high school senior with the opportunity to apply for college and associated financial aid with increased ease.

Since preparation for college entrance requires an increasingly sophisticated understanding about admissions and financial aid processes, efforts need to begin as early as ninth grade to prepare students for college admissions through statewide financial aid and admissions literacy programs. Such programs should increases students', parents', community leaders', and school administrators' knowledge of the college application process and of available grants, scholarships, loans and work-study programs and should provide training and support to complete the Free Application for Federal Student Aid (FAFSA).

58 Klein, Allison, "For Kentucky's P-16 Council, Quiet Influence Proves Best" *Education Week* Vol. 27, Issue 40 (June 5, 2008), 12-13. www.edweek.org/ew/articles/2008/06/05/40kentucky.h27.html.

59 P-16/P-20 Councils Database, Education Commission of the States Website. [Accessed on October 3, 2008.] http://mb2.ecs.org/reports/Report.aspx?id=911. These states are: Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Maryland, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Hampshire, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.

60 "Education Commission of the States' High School Information" Webpage, Education Commission of the States Website (2008). www.ecs.org/html/education-issues/HighSchool/highschooldb1_intro.asp?topic=p-20.

61 "Education Commission of the States' High School Information" Webpage.

62 Examples include Gaining Early Awareness and Readiness for Undergraduate Programs (GEARUP) and South Carolina Higher Education On Line Application and Resources (SCHOLAR). Details about these and other programs can be found at http://www.che.sc.gov/New_Web/Students&Parents.htm.

Objective 3: Increase Higher Education Graduation Rates

In 2007, 56.4% of undergraduate students at four-year South Carolina institutions received their degree within a six-year time period, compared to the national graduation rate of 56.1% during the same time period.[63] In 2007, 13.4% of students at two-year South Carolina institutions received their intended certificate within a three-year time period, compared to the national average of 27.8%. South Carolina is on par with the national average in the four-year institution category (ranking 22nd in 2007), yet ranks 49th in the nation in the two-year institution category.[64]

According to the U.S. Bureau of Labor Statistics, in 2007, U.S. workers 25 and older with a bachelor's degree earn $51,324 a year on average, while those with a high school diploma earn $31,539.

U.S. Bureau of Labor Statistics, 2008

Unfortunately, too many South Carolina students at both two-year and four-year institutions withdraw from postsecondary education programs each year without earning a degree or certificate. The decision to withdraw from college often occurs during the first year of enrollment: in 2006, South Carolina was precisely at the national norm of 77.7% for full-time freshman retention at four-year public institutions, yet still well below the national leader, Delaware (84.9%). However, full-time first-year student retention at two-year public institutions in South Carolina was considerably lower: in 2006, South Carolina ranked 40th in the nation at 52.9%, as compared to the national norm of 58.5% and well below the national leader, South Dakota, at 71.6%.[65]

The old adage that "some college is better than no college" unfortunately rings hollow in a society that increasingly places importance on higher education credentials as a key employability factor.[66] Many issues influence whether a traditional or non-traditional student will earn a credential or degree from an academic institution, including but not limited to a student's socioeconomic background, parental education attainment, financial means, general college readiness, and support network. Reports from ACT and the College Board (SAT) indicate that rigorous academic preparation in elementary and secondary school increases the chances of a student's success in college. However, South Carolina's colleges and universities also have a major role to play in promoting student success, and they are obliged to improve and create new supporting actions which will help increase higher education graduation rates across the state.

Supporting Actions in Process

Retention Programs

- Include academic support services, new student orientation, service learning, academic advisement, counseling, tutoring, cultural enrichment, "freshman year" and "sophomore year" programs.

Summer Transition Programs

- Provide opportunities for students to acclimate to college learning, usually during summer school, by earning college credits, orienting to campus life, and reviewing skills necessary for success in college.

High School to College Transition Programs

- Assist high school students to improve academic skills through offering pre-college experiences such as "campus Saturdays," dual/concurrent enrollment courses, and summer transition programs.

Financial Aid

- Provides support for students, including Palmetto Fellows, HOPE and LIFE Scholarships; need-based grants; and Lottery Tuition Assistance programs, as well as the Tuition Grants Programs and institutional grants and scholarships, which enable students to attend college.

Enrichment, College, and Career Information Programs

- Enhance student awareness through GEAR UP, College Access Challenge, College Goal Sunday and Student Portal (via EEDA).

Accelerated Learning Programs

- Provide enriched high school curricular options including AP, IB, dual/concurrent enrollment, Project Lead the Way (Engineering) and College Level Examination Program (CLEP).

College Readiness/College Success Programs

- Provide academic enrichment and support via academic success/ learning centers, math and writing labs, developmental studies/ remedial courses (technical colleges), computer-assisted Instruction and mentoring/coaching/ peer tutoring.

Bridge Programs

- Provide academic enhancement and seamless pathway for transfer students.

Recommendation 1.21. Ensure affordability of higher education through increased state funding.

The state needs to invest more in the operating funds of institutions of higher education. In South Carolina, the total percent of the state budget appropriated to institutions of higher education (recurring appropriations) decreased every year from 1998 to 2008 (14.9% to 11.3%).[67] The appropriations of state tax funds for operating expenses for higher education significantly increased between 1998 and 2008 for a number of states, including neighboring North Carolina and Georgia. During this ten-year period, funding for the University of Georgia System increased from nearly $1.4 billion to $2.4 billion (51.6% increase). Higher education funding in North Carolina increased from $2 billion to $3.7 billion (86.6% increase). Funding increased in South Carolina from $654 million to $758 million (merely 15.8%, compared to the national norm of 56.3%).[68]

The state also needs to invest more in the capital needs of institutions of higher education. In 2000, North Carolina passed a $3.1 billion Higher Education Bond Referendum for the state's higher education system.

63 "Graduation Rates 2007," The National Center for Higher Education Management Systems Information Center Website. [Information gathered from National Center for Educational Statistics IPEDS Graduation Rate Survey.] [Accessed October 2, 2008.] www.higheredinfo.org/dbrowser/index.php?year=2007&level=nation&mode=data&state=0&submeasure=24.

64 "Graduation Rates 2007." The national leader in associate degree graduation rate, South Dakota, graduated 76% of students within a three-year time period.

65 *Nebraska's Coordinating Commission for Postsecondary Education—2008 Progress Report*, 85.

66 According to a March 28, 2005, U.S. Census Bureau news release: "Workers 18 and over with a bachelor's degree earn an average of $51,206 a year, while those with a high school diploma earn $27,915." "College Degree Nearly Doubles Annual Earnings, Census Bureau Reports," U.S. Census Bureau Website (2005). www.census.gov/Press-Release/www/releases/archives/education/004214.html.

67 *South Carolina Higher Education Statistical Abstract*, South Carolina Commission on Higher Education (2008), 112.

68 "Fifty State Summary Table," Center for the Study of Education Policy (Illinois State University), Project Grapevine Website, (2008). www.grapevine.ilstu.edu/fifty_state_summary.htm.

These funds were used for the repair and renovation of university dorms, classrooms, and science and technology labs for more than 300 public university and college facilities across the state.[69] In contrast, South Carolina last approved a statewide capital bond bill in 2000 for $137.4 million, of which $89 million was for higher education.

Finally, the state needs to reduce the financial burden on students through increasing need-based grants. In 2008-2009, need-based grants accounted for only 17.3% ($53 million) of state financial aid appropriations, compared with 67.3% for merit-based grants ($207 million). In addition, a task force should study whether LIFE Scholarship recipients should be allowed to receive state financial aid for the summer terms if they are enrolled in a program which is designed with summer as an expected term in their program of study.

[See also Recommendations 2.18, 3.3, and 4.2.]

Recommendation 1.22. Create incentives and requirements for seamless student transitions between and among two-year and four-year institutions, including the implementation of a statewide initiative to monitor transfer effectiveness.

Since seamless transitions should exist for students who wish to (a) transfer from a two-year to a four-year institution; (b) transfer between four-year institutions; and (c) transfer between two-year institutions, relevant existing provisions of the 1996 Statewide Policy on Transfer and Articulation will be enforced.[70] The policy states that any student who has completed either an associate of arts or associate of science degree program which contains a transfer block will automatically be entitled to junior-level status (i.e., for priority in registration for courses, residence hall assignments, etc.). As such, this policy promotes seamless transition and timeliness toward degree completion. An explicit listing of rights of students transferring will also be added to this list.

Many Southern Regional Education Board (SREB) states have developed successful college transfer programs that have a number of common elements (transfer/articulation committees, core curriculum, common course numbering systems, transfer guide, guarantees of transfer, transfer-counselor networks, appeals procedures, monitoring and auditing systems, and faculty involvement) which help ensure that students can transfer credits from one institution to another with relative ease.[71] SREB recommends that states monitor the comparative number of credit hours taken in the junior and senior years by both transfer and non-transfer students and to evaluate the guarantees the state makes to transfer students regarding credits earned from two-year colleges and how they are applied to four-year degrees.

Bonus funding should be provided by the state to institutions for transfer students who complete baccalaureate degrees within 150% of normal degree completion.[72] (The 150% normal degree completion rate is six years for a baccalaureate degree and three years for an associate's degree.) This funding would help to maximize the number of students transferring from two-year institutions to four-year institutions. This funding would also help to minimize the number of courses taken by transfer students which are not needed for a degree.

The state will also implement a policy so that a student who transfers from a two-year institution to a four-year institution may "reverse" transfer courses back to the two-year institution for the conferring of an associate's degree by sending a transcript back to the two-year institution.

[See also Recommendation 3.22.]

Recommendation 1.23. Implement the state-funded Course Articulation and Transfer System (CATS) at the earliest possible opportunity in order to improve the efficiency and effectiveness of transfer processes, to reduce time-to-degree, and to monitor progress to degree completion.

The state of South Carolina currently does not have a statewide system for academic reporting, course articulation, course transfer, and similar functions. CHE is in the process of implementing a multi-user, multi-campus commercial package based on current technology that can meet the needs of students and higher education institutions. A web-based system for statewide use (software, hardware, and licensing) will assist students with academic planning and transfer of credits between and among institutions.

Recommendation 1.24. Increase alternative delivery methods of appropriate courses and/or programs to reach underserved students, especially non-traditional students, and create greater flexibility as to the time and location of the learning process.

Institutions are encouraged to make greater use of distance-learning capabilities and non-traditional formats (including shorter courses, weekend formats and accelerated scheduling) to extend education to students who have geographic restrictions and who need scheduling flexibility. Higher education institutions will collaborate to expand distance education across the state. The two primary modes of instructional delivery for distance education are the Internet and "two-way video technologies."[73] Adults are more likely to participate in distance education courses than traditional students because of work schedules and family responsibilities.[74]

Recommendation 1.25. Promote timely degree completion by establishing appropriate credit hour maximums.

Institutions will consider limiting the credit hour requirement for baccalaureate degrees to 120-130 credit hours (unless accreditation

69 "Building for the New Millennium," University of North Carolina Website (2000). http://uncbuildings.northcarolina.edu/points.cfm.

70 "Statewide Agreement on Transfer and Articulation," SC Commission on Higher Education Website (October 2002). www.che.sc.gov/AcademicAffairs/TRANSFER/regs.htm.

71 *Clearing Paths to College Degrees: Transfer Policies in SREB States*, Southern Regional Education Board (2007), 3-7. SREB recommends that states monitor the effectiveness of transfer policies including performance of transfer students, the comparative number of credit hours taken by transfer and non-transfer students, and degree completion for transfer and non-transfer students. SREB also recommends that states "insist on performance measures that monitor the total hours accumulated in undergraduate education by both transfer and non-transfer students" (11).

72 *Clearing Paths to College Degrees*, 11. SREB recommends that states should "set statewide policies that give transfer students similar total credit hours toward a bachelor's degree as students who begin at four-year institutions" (11).

73 Tabs, E.D., *Distance Education at Degree-Granting Postsecondary Institutions: 2000-2001,* National Center for Education Statistics, U.S. Department of Education (July 2003), v. The institutions that offered distance education courses in 2000-2001 indicated that they would continue offering distance education courses, and 88% of these institutions stated that they would increase the number of Internet courses. "Sixty-nine percent of the institutions indicated that increasing student access by making courses available at convenient locations was very important, and 67% reported that increasing student access by reducing time constraints for course-taking was very important" (vi).

74 *Nontraditional Undergraduates: Findings from the Condition of Education* (2002), National Center for Education Statistics (2002), 10. 1999-2000 survey results of students taking distance education courses show 60% participate through the Internet. Thirty-nine percent of these student participated through prerecorded television or audio, and 37% of these students participated through live television or audio (11).

requires a greater number of credit hours).[75] Restructuring programs to a four-year graduation expectancy will greatly benefit students financially and will increase the capacity of the system.

Institutions will also consider limiting the credit hour requirement for associate degrees to 60-72 credit hours. As noted above, South Carolina ranks 40th in the nation for full-time, first-year student retention at two-year public institutions. Lowering the credit hour requirement will greatly increase the chance of degree completion by associate de .

Recommendation 1.26. Promote additional options for timely degree completion such as expanding the use of test-out provisions (including College Level Examination Program examinations) and awarding credit based on life experience.

Institutions will expand the use of "test out" provisions to award college credit based on knowledge and experience. Many institutions in the U.S. accept credit equivalency examinations as demonstration of knowledge in a particular subject area and grant credit accordingly.[76] Institutions will also establish a rigorous, carefully monitored process for awarding credit and/or exemptions based on life experience for non-traditional students.

Recommendation 1.27. Redesign academic programs to improve student results while reducing costs through the exploration of course redesign initiatives.

Course redesign is the process of redesigning whole courses (rather than individual classes or sections) to achieve better learning outcomes at a lower cost by taking advantage of the capabilities of information technology. The National Center for Academic Transformation (NCAT) worked with institutions to redesign courses to achieve better learning outcomes at a lower cost through the use of information technology.[77] The Program in Course Redesign (funded through a PEW Charitable Trusts grant) produced five flexible yet distinct course redesign models that achieved both positive gains in student learning and reduced costs to the institution. Of the 30 institutions studied, 25 measured significant increases in student learning in the "redesigned" course. Twenty-four of the institutions studied also measured student retention; of these, 18 showed significant increases in course completion. All 30 institutions reduced instructional cost by an average of 37%.[78]

The Program in Course Redesign is a national effort funded by the Pew Charitable Trusts and led by the Center for Academic Transformation. The program examined the potential of redesigning introductory-level courses in the disciplines which nearly all students must take in the first few years, e.g., psychology, chemistry, mathematics, history, biology, etc. Courses are restructured so as to improve efficiency (lower the unit cost of instruction) and improve student learning.

[See also Recommendation 3.27.]

Recommendation 1.28. Provide more effective developmental education.

The loss rate for students who enter higher education without proper preparation is enormous. For example, a careful study in Kentucky concludes that, despite active developmental efforts, "underprepared students were still twice as likely to drop out of college as prepared students."[79] South Carolina has some effective strategies in developmental education, including participation in the national projects such as Achieving the Dream Community Colleges Count project.[80] In the long run, South Carolina's existing Course Alignment project (SC CAP) that is focused on strengthening the transition from high school to college may eliminate a significant portion of developmental education; it should also draw attention to what the College Board and ACT, Inc. have been reporting for several years about the essential role course selection plays in preparation. But in the meantime, the state must make a more concerted effort. It is not acceptable to have so many students enter college and fail. Two core strategies in developmental education should be explored.

First, the best remediation occurs before students enter college. South Carolina should have a system that provides for early assessments (usually at the end of the junior year of high school) that tell students what they need to do to avoid remediation and what placement they will have if they fail to make the necessary progress. This diagnostic system should be backed up with active programs in the schools and online to ensure that high school students have ample opportunities to improve their knowledge and skills.[81] [See also Recommendations 1.2, 1.3, 1.12, 1.14, and 1.16].

A second education strategy should be to develop a standardized, research-based, continuous improvement-focused system of developmental education to ensure that all students throughout the state who need these services receive the most effective and efficient instructional support possible.

75 CHE conducted a 1996 study on credit hours to degree *Credit Hours to Degree*, SC Commission on Higher Education, 1996. http://eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/14/65/3c.pdf.) The study analyzed the number of semester credit hours required for graduation from baccalaureate degree programs at South Carolina's public institutions with data from 1995-96 and 1985-86, and found that the "average number of semester credit hours required for graduation from a four-year, baccalaureate program at a public institution had increased from a system-wide average of 125.8 credits in 1985-86 to 127.9 credits in 1995-96." Additionally, 30 of over 400 programs exceeded 140 credit hours and six of these were first professional or 5-year programs. A CHE survey conducted in September 2008 further revealed that institutions do not have policies that stipulate a maximum number of credit hours.

76 The College-Level Examination Program (CLEP) consists of a series of equivalency examinations that are offered by The College Board. Dantes Subject Standardized Tests (DSST) sponsors a wide range of examination programs to assist service members in meeting their educational goals and allows people to earn college credit for knowledge gained outside the traditional classroom. Excelsior College Exams (ECE), formerly the Regents College Examination series, offer 40 exams in the arts and sciences, business, nursing, and education.

77 See the National Center for Academic Transformation Web site: www.thencat.org/index.html.

78 "Six Models for Course Redesign," National Center for Academic Transformation Website (2008). www.thencat.org/R2R/R2R%20PDFs/Six%20Models%20for%20Course%20Redesign.pdf.
Additional programs which were funded by a FIPSE grant include Roadmap to Redesign (2003-06) and Colleagues Committed to Redesign (2006-09).

79 *Developmental Education Update,* Kentucky Council on Postsecondary Education (October 5, 2006), 2.

80 "Achieving the Dream "is a multiyear national initiative to help more community college students succeed. The initiative is particularly concerned about student groups that traditionally have faced significant barriers to success, including students of color and low-income students." Achieving the Dream Website (2005). [Accessed: October 3, 2008.] www.achievingthedream.org/default.tp.

81 Several assessments are currently being used. The Department of Education is in the process of developing a new assessment that will be diagnostic in nature to replace the state's PACT. S.C. Technical Colleges use COMPASS, a diagnostic assessment, for all incoming students, and the State Department of Education funds the PSAT or PLAN for all tenth grade students in public high schools across the state to offer diagnostic feedback for students as they begin high school and preparation for postsecondary education.

Recommendation 1.29. Develop and monitor institutional retention plans for student success.

Using best practices, institutions will establish aggressive retention plans with particular emphasis on freshmen-to-sophomore and sophomore-to-junior retention and report regularly on results.[82] The Center for Retention Studies at Syracuse University developed a five-year plan to improve the overall graduation rate for Syracuse University.[83] Since 2002, the MetLife Foundation Initiative on Student Success has recognized 16 community and technical colleges for exemplary performance in student retention.[84] The Success Challenge Program (Ohio Board of Regents) requires institutions to submit plans that outline how funds will be used to assist at-risk students to complete baccalaureate programs.[85] In addition, institutions will increase the retention of first-generation and low-income students through initiatives such as Achieving the Dream.

Recommendation 1.30. Create legislative incentives (tax credits, tuition rebates for degree completion, etc.) to encourage students to earn an academic certificate or degree, especially for students who remain in South Carolina for a certain period of time following degree completion.

The state should offer tax credits to graduates who agree to stay in South Carolina as one option. Such tax credits would lead to retention of educated individuals who contribute to the state workforce and citizenry. In 2007, the State of Maine passed legislation which provides tax credits to lower the cost of student loans for college graduates who decide to stay and live in Maine.[86] In 2008, Ohio legislators announced intentions to draft legislation to give tax credits to college graduates who stay in the state following graduation.[87]

Recommendation 1.31. Create an early warning system at institutions of higher education to prevent student withdrawal during first semester of first year.

In addition to academic performance, a number of issues can result in a student's withdrawal from a degree or certificate program, including but not limited to changes in family structure, psychological challenges, emotional or social distractions, etc.[88] The majority of students who withdraw from postsecondary degree programs determine to do so during the first three weeks of the first academic term.[89] Institutions will develop networks and early-warning systems to support students when they need help, and will also strive to provide students with prompt, frequent feedback on academic performance, especially during the first year.

Recommendation 1.32. Increase availability of applied baccalaureate degrees to meet workforce needs and increase available pathways in order to bolster educational attainment for associate degree holders.

Many South Carolinians with a technical associate degree can increase their educational attainment level by obtaining an applied baccalaureate degree, also known as a "2+2" model. Increasing the availability of applied baccalaureate degree programs could increase the number of students who transfer to a four-year institution after receiving an associate's degree from a technical college. Programs of this type have emerged because of the increasing importance of the baccalaureate degree to individuals who are looking either to deepen their knowledge and skills base or to compete for better jobs. These programs could also increase the number of non-traditional students who pursue a baccalaureate degree.

According to *The Adult Learner and the Applied Baccalaureate: National and State-by-State Inventory,* an applied baccalaureate degree is defined as "a bachelor's degree designed to incorporate applied associate courses and degrees once considered as 'terminal' or non-baccalaureate level while providing students with the higher-order thinking skills and advanced technical knowledge and skills so desired in today's job market."

Lumina Foundation, 2008

The curriculum for applied baccalaureate degree programs is focused on meeting industry's demand for employees with specific skills. As such, an applied curriculum emphasizes the understanding of theory and its use in the workplace. One outcome of this emphasis is that more of the required courses are related to the specific skills needed and fewer general liberal education credits are required to meet the degree requirement. New applied baccalaureate programs should be developed only with active business involvement. Some baccalaureate degrees have been developed exclusively as "completion" (2+2) programs. Others have both generic tracks (for those who have no prior experience in the field) and completion tracks (for those who have an associate degree in the field).

Technical associate degree programs should be surveyed systematically to ensure the optimal use of such degrees as foundations for building additional technical baccalaureate degree options which show promise to expand student career choice, meet the needs of business and industry, and promote the economic development of the state. Some of the technical programs that need to be surveyed would require negotiation for national professional accreditation. Programs of this nature include associate degree programs in business, physical therapy,

82 "Diploma to Nowhere," Strong American Schools (2008), 12-13. www.edin08.com/uploadedFiles/Issues/Issues_Pages/DiplomaToNowhere.pdf. Report recommendations include (a) higher education institutions should have a full understanding of the academic needs of first-year students long before they are on campus, (b) policymakers should be more aware of instructors of remedial courses at the postsecondary level and the type of professional development needed, and (c) institutions should review many indicators of college readiness, including Act data, Advanced Placement scores, and first-year course failures.

83 The Center for Retention Studies Website. [Accessed: September 30, 2008.] http://retentioncenter.syr.edu/. "The goal of the five-year strategic plan is to raise the six-year graduation rate, for undergraduate classes entering Fall 2001 and later, to at least 80% in six years and to at least 85% in ten years."

84 *Community College Survey of Student Engagement Highlights*, Community College Survey of Student Engagement (January 2007), 1. www.ccsse.org/publications/Jan2007.pdf.

85 *Success Challenge Plans: A Synopsis of Plans Submitted by Universities for FY 2006*, Ohio Board of Regents (2007). http://regents.ohio.gov/hei/success/Success-Challenege-2006-Campus-Plans.pdf [sic].

86 M.R.S. Title 20-A, Chapter 428-C: "Job Creation Through Educational Opportunity Program." http://janus.state.me.us/legis/statutes/20-A/title20-Ach428-Csec0.html. See also: http://opportunitymaine.org/index.php . Tax credits are capped at $2,100 per year and will last for 10 years or until the recipient moves out of state.

87 Marshall, Aaron, " Tax Credits Proposed for College Graduates Who Stay in Ohio," *The Plain Dealer Bureau* (August 21, 2008). www.cleveland.com/news/plaindealer/index.ssf?/base/news/1219307676150810.xml&coll=2. The plan would offer tax credits over a 10-year period totaling $5,000 for completing an associate's degree, $20,000 for completing a bachelor's degree, and $30,000 for a master's degree or higher.

88 Of the 45% of students who fail to earn degrees nationally, only 25% are dismissed for academic performance. *More Student Success: A Systematic Solution*, State Higher Education Executive Officers, 2007, 96.

89 Dr. David Conley, address, "Improving Postsecondary Readiness and Success," South Carolina Higher Education Trustees Conference, Columbia Convention Center, Columbia, September 24, 2008.

and occupational therapy. Nevertheless, such issues should not preclude efforts to develop new baccalaureate programs in these and other degree fields and to provide seamless transitions from the associate to the baccalaureate program level.

Recommendation 1.33. Explore how the higher education funding mechanism could be structured better to support student success more effectively.

While finance policies for state higher education have historically focused on enrollment growth, some states have begun shifting policies toward outcome indicators such as degree completion.[90] The National Governor's Association Center for Best Practices recommends that stronger fiscal incentives be placed upon postsecondary completion.[91] The Commission on the Future of Higher Education has also advanced the idea of tying accreditation to degree completion rates and job placement rates.[92]

Working collaboratively with institutions of higher education and other policymakers, CHE will lead this exploration. This exploration should also take into consideration the Voluntary System of Accountability, in which many of the state's institutions of higher education participate.

Recommendation 1.34. Add a new component in the higher education funding model to increase support of college readiness services such as tutoring, coaching, math and reading labs, academic success/learning success centers, computer and technology labs, mentoring, and other supplemental instruction.

Currently, the Mission Resource Requirements (MRR) funding model includes student readiness for college success as part of a multi-faceted step process under the category of Student Services. This category includes funds to be spent on activities that contribute to the student's emotional and physical well-being and to the intellectual, cultural, and social development outside the context of the formal instructional program.[93] To allow for better focus on college success, student readiness should be removed from this process and become a separate component.

Objective 4: Increase Adult Participation in Higher Education

"For too many adults who want to earn postsecondary credentials, the traditional structure and organization of higher education pose significant barriers to access and, particularly, to persistence and success."

Adult Learners in Higher Education: Barriers to Success and Strategies to Improve Results
U.S. Department of Labor, 2007

South Carolina has approximately 924,000 residents 25 years of age and older who hold only a high school diploma and another 520,000 residents who have some college but no degree.[94] These numbers, large for a state of South Carolina's population (approximately 4.5 million),[95] represent a significant pool of citizens who may have much to gain from increased education at the certificate, associate, and baccalaureate levels. Non-degree holding adults are an unrealized source for potential economic growth within the state. A recent Texas study indicates that programs aimed at increasing the overall educational level of these citizens will have significant and lasting positive effects for that state.[96]

The state's technical college system is the primary source of education for adult learners in South Carolina. It offers a wide range of certificates, diplomas, and associate degrees, including the Associate of Arts and the Associate of Science degrees, and serves as a conduit to four-year institutions for both traditional and adult learners. Within this system in which the average student is approximately 27 years old, academic policies affecting adult learners are largely controlled by individual institutions. Even with this emphasis, however, there is no statewide marketing plan or other statewide initiative within the system to serve this population. The technical colleges are far more likely than the senior institutions to offer evening and weekend courses for adult learners, but there are institutional differences in policies on course expiration, forgiveness of previously earned grades after long absences, and the assessment of prior knowledge and experience.

There are no statewide policies in place for senior institutions that define institutional processes or policies on assessing prior knowledge, on-campus residency requirements, or course credit expiration. All of these affect adult learners, and all are controlled at the institutional level. The state's public senior institutions are overwhelmingly oriented toward the traditional student at the undergraduate level. Although several of the state's senior institutions advertise programs oriented toward adult learners, no

90 Kristin D. Conklin and Stephen Smith, "Stronger Fiscal Incentives Can Improve High School and Postsecondary Outcomes" (July 16, 2004), 1. www.nga.org/Files/pdf/0407HIGHSCHOOL.pdf. From Conklin, 10-12:
Florida implemented performance funding for the community colleges in 1996 where institutions were awarded just below 1% of the system's budget based on three performance indicators: number of A.A. degrees, A.S. degrees, and certification completers; number of these completers who were economically disadvantaged, disabled, or English-language learners or who were placed in jobs in targeted fields; and the number of A.A. completers who graduated with fewer than 72 total attempted credit hours. As of 2004, even though funding has decreased for these indicators, completion rates for community colleges have increased.
Ohio has implemented "Success Challenge," which is one of the four performance funding programs that is narrowly focused on raising graduation rates at four-year institutions.
Ohio, Florida and **Tennessee** have specific performance funding legislation that appropriates funds every year to higher education institutions which meet performance objectives.
Tennessee has the nation's longest standing performance funding program where institutions can earn a budget supplement to the instructional components of their educational and general funding budget.
Colorado passed the College Opportunity Fund which will transfer operating funds for institutions into a pool of portable student stipends (approximately $2,400). Institutions must agree to meet certain goals (improving graduation and retention rates) in order to enroll these students.

91 Conklin, 1. The report further states: "[S]tate responses to increased demand for postsecondary skills must also address institutional incentives for degree completion, such as course completion, credit-to-the-degree, and the number of postsecondary credential conferred" (9).

92 *A Test of Leadership: Charting the Future of U.S. Higher Education*, U.S. Secretary of Education Commission on the Future of Higher Education (U.S. Department of Education) (2006), 25. www.ed.gov/about/bdscomm/list/hiedfuture/reports/final-report.pdf.

93 "Current Funds Expenditures and Transfers." Section 6.15, Student Services, 32. "This category includes funds for supplemental education services to provide matriculated students with supplemental instruction outside of the normal academic program (remedial instruction is an example), counseling and career guidance, student aid administration, and student health service."

94 2005-07 American Community Survey 3-year Estimates, U.S. Census Bureau Website. [Accessed January 14, 2009.] http://factfinder.census.gov/servlet/DatasetMainPageServlet?_program=ACS&_submenuId=&_lang=en&_ts=.

95 American Community Survey 2007.

96 *A Tale of Two States—and One Million Jobs!* Ray Perryman Group (2007). www.thecb.state.tx.us/reports/PDF/1345.pdf.

public senior institution had a link for adult learners on its home page when this report was written.

South Carolina provides limited financial aid to its adult learners through the Lottery Assistance Tuition Program (available only at two-year institutions) and need-based grants. The preponderance of state level financial aid is merit-based and targeted to traditional students.

The Lottery Tuition Assistance Program serves more students in South Carolina than any other state grant program, disbursing $43 million in the 2007-08 academic year to 42,017 students. Statistics for Fall 2007 indicate that 39% of the Lottery Tuition Assistance and 23% of the South Carolina need-based grant recipients are adult learners, ages 25 and above. According to CHEMIS data, 11,458 of the 29,211 Lottery Tuition Assistance recipients between 2002 and 2008 were adult learners. Of these adult learners, 3,454 were full-time, and 8,004 were part-time students.

Supporting Actions in Process

Information Website for Non-Traditional Students (USC)

- Summarizes non-traditional means by which students may take courses and earn degrees (e.g., courses delivered by satellite, off-site locations, online, etc.); provides information about weekend and evening courses; and provides contact with adult student services advisors to help with admissions, course advisement, financial aid, etc. (www.learn.sc.edu)

"New Start" Program (Winthrop University – Admissions Office)

- Helps non-traditional students with the admissions process and also provides support once enrolled.

Alternative Delivery Modes

- Assists students with services such as online learning; off-site courses; distance learning via correspondence and video courses; courses at the Lowcountry Graduate Center and University Center of Greenville; certificate programs; on-site job training and seminars for the workforce; and evening undergraduate programs.

Certificate Evaluation (Technical Colleges)

- Evaluates certificates (such as Cisco Certificates, etc.) for academic course credit equivalency.

The Personal Pathways to Success web portal (EEDA)

- Links adult learners to the Regional Education Centers, which provide higher education and financial aid information. (www.scpathways.org)

***Kuder Journey* (Component of Kuder® Career Planning System)**

- Allows adults to assess their skills and interests; identifies related occupations; and provides information about postsecondary institutions, available through the web portal. (www.Kuder.com)

Recommendation 1.35. Create a "New Front Door" that makes the transition to higher education vastly easier for adults.

A system of stackable pre-college certificates could change the dynamics of learning for adults, many of whom lack the time, funds, flexibility and confidence to extend their education. The certificates would be low-cost, self-paced, and (like much industry training) competency-based (no fail). Students earning certificates could move on to degree programs or advanced training. (For the latter, as many certificates as possible would later transfer to a degree program.) Implementing a clear, coherent, standardized statewide pathway for adults to further their education would also make possible an active marketing program, something that is essential for this segment of the population.[97] The New Front Door concept has been endorsed by the Technical College System Board of Trustees and by the Connect Adults Committee of the New Carolina[98] Education and Workforce Development Task Force.

[For further information, see Appendix III; see also Recommendations 2.14, 3.10, and 3.21.]

Recommendation 1.36. Provide state financial aid and/or state grants targeted to adult learners.

Cost can be a significant barrier to adults considering higher education. Adult learners should be provided with comprehensive financial aid information as well as targeted grant programs in order to increase their access to higher education. For example, Kentucky provides the need-based *Go Higher Grant* to resident students at least 24 or older who enroll part-time at a participating Kentucky college or university.[99] Also, Kentucky's *Project Graduate* provides incentives such as targeted financial aid to encourage students who have 90 or more college credit hours to return to higher education. Targeted grants can also enable adult learners to enroll full-time and significantly reduce the time involved in earning a degree.

[See also Recommendation 3.19.]

Recommendation 1.37. Create statewide policies for assessing prior knowledge, on-campus residency requirements, and course credit expiration.

Each of the elements in this recommendation represents a barrier to an adult learner who may have mobility needs, be relatively unsophisticated in higher education matters, and/or have significant time gaps in between enrollments. A common approach to providing services is necessary to eliminate these barriers.

Recommendation 1.38. Develop a coordinated set of blended online/on-campus degree programs delivered cooperatively through different institutions.

Colleges and universities could jointly develop blended degree programs with much of the content provided online but with important components offered on campus. For example, a student living in Florence and enrolling in a statewide baccalaureate program would enroll at Francis Marion University and receive the degree from that university, but much of the coursework would be online with instruction and administration shared through the university partnership. Important components, for example labs or seminars, would be offered on-campus. This approach would lower the unit cost of instruction and provide more diverse program opportunities while ensuring that students still have access to the personal connections and physical resources that can be an essential part of a high quality program.[100]

97 Ohio is creating a system of basic academic and technical certificates that can be combined to count toward a college degree. See Pyle, Encarnacion, "Building blocks lead to a degree," *The Columbus Dispatch* (March 31, 2008).

98 New Carolina is a non-profit, public-private partnership working to increase South Carolina's economic competitiveness (also known as South Carolina's Council on Competitiveness).

99 "Kentucky Resident Scholarship/Grant Information," Kentucky Higher Education Assistance Authority Website (2008). www.kheaa.com/website/kheaa/gohighergrant?main=1.

100 Tennessee has a collaborative online degree program similar to the one described here. See information about the Regents Online Degree Program at: www.rodp.org/home.htm.

Currently under consideration in higher education in South Carolina is the creation of the South Carolina Graduate Professional Alliance. Among other things, this alliance would explore development of collaborative statewide graduate programs that would emphasize flexible learning, including extensive online coursework, statewide graduate certificate programs in critical areas, and the exchange of specialized coursework among institutions using advanced video technology.[101]

Recommendation 1.39. Create a web portal that serves as a clearinghouse of information for adult learners.

There is no easily identifiable state source for information on adult learner-focused programs, including financial aid and student support services. This lack creates an initial barrier to information that may discourage potential adult learners. The institutions of higher education and CHE will develop web content dedicated to the adult learner, including online admissions and financial aid applications and information about services geared exclusively toward adult learners (e.g., grants and financial aid targeted to adult learners, career planning, online learning). This content could reasonably be accessed through the Personal Pathways to Success© and Regional Education Center (REC) websites being developed through the EEDA, thereby giving adult learners easy access to other business and educational content on those websites.

[See also Recommendation 3.24.]

Recommendation 1.40. Develop coordinated outreach programs that focus on adults without college degrees.

In order to eliminate information barriers which limit access for adult learners, marketing and outreach plans that acknowledge and address the unique qualities of adult learners in recruiting, programs, and support services will be developed. A 2000 publication released by The Council for Adult and Experiential Learning highlights strategies such as focused marketing and on and off-campus presentations of information for adult learners.[102] The publication also states that an integral part of outreach is changing the campus culture to meet more readily the needs of adult learners.[103] Some examples of campus cultural changes might include the use of creative scheduling such as "mini-mesters" and evening classes; increased availability of services such as admissions, advising, faculty hours outside of normal business hours; and basic services such as the availability of General Equivalency Diploma (GED) preparation and testing in a college setting.

[See also Recommendation 1.6.]

Recommendation 1.41. Create a centralized transcript repository.

A voluntary centralized database of course transcripts for each student who enrolls in a South Carolina higher education institution will be created. This database will be designed to allow adult students to build a single transcript from courses taken at multiple institutions and maintained in a single location at CHE. Such a database will allow adults who attended South Carolina institutions to access multiple records from a single source.

Recommendation 1.42. Implement a cooperative, statewide initiative to reduce gaps in technological literacy among potential adult learners.

If alternative delivery methods, especially online learning, are used as a significant portion of efforts to reach adult learners, it is important to bridge existing gaps in technological literacy among those learners. These efforts might include no-cost enrichment courses, seminars, and presentations offered in non-traditional settings (e.g., libraries, community and adult education centers, businesses, and churches). Such offerings should be designed and offered by higher education institutions and should be focused on helping participants to reap maximum benefits from future non-traditional course offerings in which they enroll.

Objective 5: Attract and Retain More Graduates

Attracting and retaining more graduates can be a significant part of making South Carolina one of the most educated states. Quality of life—which is related to but greater than new jobs and higher incomes—is likely to attract persons from outside the state with significant academic credentials and new ways of looking at issues and possible solutions. Likewise, quality of life is likely to retain recent South Carolina graduates of higher education in the state.

This process of attracting and retaining talented graduates will be occurring in an environment in which South Carolina's demographic projections will be greatly changed from past eras. Two major shifts will occur: (a) a 123% increase in population groups over 60 by 2030,[104] and (b) significant growth in both the legal and undocumented populations of Spanish-speaking people (e.g., an estimated 453% increase of legal immigrants from 1990 to 2007).[105]

In addition to these shifts in population bases in the state, the basis for trade in goods and services will no longer be within the United States (and/or just within South Carolina), but rather directed to and from the rest of the world in an increasingly sophisticated environment driven by natural resources, adequate labor supply, and sophisticated knowledge bases and technology accessible to the labor supply. South Carolinians' ability to work, trade, and enjoy the pursuit of happiness will increasingly be dependent upon how the state responds to these impending changes.

Supporting Actions in Process

Spoleto Festival

- Annual spring festival of the arts in Charleston, which has made the world take notice of the arts tradition in South Carolina.

101 Walters, Dr. Garrison, "South Carolina Commission on Higher Education Graduate/Professional Initiative" (September 26, 2008), 2-3. This proposal envisions funding 20 stipends per year for a total cost of $200,000 per year, and students could hold them for up to four years.

102 *Serving Adult Learners in Higher Education: Principles of Effectiveness (Executive Summary)*, Council for Adult and Experiential Learning (2000), 6. www.cael.org/pdf/publication_pdf/summary%20of%20alfi%20principles%20of%20effectiveness.pdf.

103 *Serving Adult Learners in Higher Education*, 6.

104 *File 3. Interim State Projections of Population by Single Year of Age: July 1, 2004 to 2030* (Excel File), "U.S. Population Projections" Webpage, U.S. Census Bureau Website, (Last updated August 28, 2008). www.census.gov/population/www/projections/projectionsagesex.html.

105 "DP-1. General Population and Housing Characteristics: 1990; Data Set: 1990 Summary Tape File 1 (STF 1) 100-Percent data; Geographic Area: South Carolina" [Accessed October 1, 2008]; "QT-P9. Hispanic or Latino by Type: 2000, Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data, Geographic Area: South Carolina" [Accessed October 1, 2008]; "T4-2007. Hispanic or Latino By Race [15], Data Set: 2007 Population Estimates" [Accessed October 1, 2008], U.S. Census Bureau Website, http://factfinder.census.gov/servlet/QTTable?_bm=y&-geo_id=04000US45&-qr_name=DEC_1990_STF1_DP1&-qr_name=DEC_1990_STF1_QTP1E&-ds_name=DEC_1990_STF1_&-_lang=en&-redoLog=false&-CONTEXT=qt; http://factfinder.census.gov/servlet/QTTable?-geo_id=04000US45&-qr_name=DEC_2000_SF1_U_QTP9&-ds_name=DEC_2000_SF1_U; www.factfinder.census.gov/servlet/DTTable?_bm=y&-state=dt&-context=dt&-ds_name=PEP_2007_EST&-mt_name=PEP_2007_EST_G2007_T004_2007&-tree_id=807&-all_geo_types=N&-_caller=geoselect&-geo_id=04000US45&-search_results=01000US&-format=&-_lang=en.

SC Geriatric Loan Forgiveness Program

- Grants medical school loan forgiveness for physicians who open and maintain a practice in the field of Geriatric Medicine or Geriatric Psychiatry in South Carolina, for no fewer than five consecutive years; applicants declare intent that 60% of patients in the practice will be Medicare recipients age 60 or older.

National Health Service Corps State Loan Repayment Program (SC Office of Rural Health)

- Attracts physicians and other healthcare advanced practitioners who agree to practice in rural and underserved areas in exchange for loan forgiveness (totals as much as $40,000 over several years).

Governor's Schools for Mathematics and Sciences (Hartsville) and for the Arts and Humanities (Greenville)

- These are both residential programs for the state's most gifted secondary students. The former, located in Hartsville, provides a powerful program in mathematics and the sciences for juniors and seniors in secondary schools. It has made great strides in retaining its graduates in the state's institutions of higher education. According to its website, the school is ranked among the Top 20 best academic secondary schools in the nation. [See: www.scgssm.org] The latter, also a residential facility, is located in Greenville and provides rigorous pre-professional arts training as well as an intense and innovative academic education that fosters connections to the arts. [See: www.scgsah.org]

Partnership Among South Carolina Academic Libraries (PASCAL)

- Unites 57 public and private academic libraries in the state through modest statewide funding (which had been $2,000,000 until this year when it diminished to less than $200,000, owing to the economic problems of the state), creating access to thousands of volumes of scholarly research for all postsecondary students.

Health Sciences South Carolina

- Improves research and education in the health sciences through an alliance of health-related institutions, including the state's three senior research institutions, Greenville Hospital System University Medical Center, Palmetto Health, and Spartanburg Regional Healthcare System.

SC LightRail

- Connects higher education research entities across the state of South Carolina to the National LambdaRail, an ultra-high-speed fiber optic network, for purposes of rapid data transmission essential to the conduct of leading-edge, collaborative research.

Recommendation 1.43. Create multiple, diverse internships, cooperative work programs, and registered apprenticeship programs for students.

As much as possible, business and industry should cooperate with institutions to develop these kinds of offerings tied to the credentialing process. Such experiences have been shown to root students into their communities, to provide them with realistic understanding of the world of work, and to motivate them to stay in an area.[106]

[See also Recommendation 2.20.]

Recommendation 1.44. Create a Fulbright-like scholarship program to attract international students in knowledge-based clusters.

Chosen on their academic merit and leadership potential, Fulbright Scholars have added considerable value to American institutions of higher education as professors and students. This program would function like the Fulbright Program at the state level and could, experimentally, be financed by a mix of eleemosynary contributions, public and private grants, corporate sponsorship, and state funding.[107]

[See also Recommendation 2.20.]

Recommendation 1.45. Increase higher education operating funding to allow institutions to offer graduate student stipends that are nationally competitive.

Data on average stipends in graduate education are difficult to obtain. However, information available suggests that research institutions in South Carolina—while not at the bottom of the scale—must do more to be competitive to attract the best and the brightest students in the country and the world. Although dated, CHE's review of existing programs conducted in the 1990s consistently noted across all disciplines that graduate stipends were lower than at most of the institutions of higher education represented by the out-of-state evaluators.

For example, average stipends at the University of Chicago in the humanities and social sciences were changed in 2007 to packages which, per year, provided for paid tuition, $19,000 for living expenses, and health insurance for each of five years. In addition, two summers of research support at $3,000 per summer will be available. This initiative "will place Chicago among the more competitive institutions in the country."[108]

University of Buffalo School of Medicine and Biomedical Sciences offers $21,000 per year for doctoral students and an opportunity to apply for the Presidential Fellowship program of $25,000 for candidates from underrepresented groups who have outstanding academic credentials. Similarly, the University of Texas-Southwestern Medical Center at Dallas offers $22,000 stipends plus tuition, student services, and insurance per year for graduate students. (The average for completion of the Ph.D. at University of Texas-Southwestern Medical Center is five-and-a-half years.)[109]

One proposal currently under discussion within higher education in South Carolina is the creation of an Innovation Scholars Program, which would provide enhanced stipends (in addition to normal) of $10,000 per year to exceptional

"Our graduate programs have distinguished the university and influenced graduate training across higher education. It is our obligation to support these programs at the highest level, allowing us to continue to attract emerging scholars who will shape academic fields and set the intellectual agenda in the decades to come."

Robert J. Zimmer
President, University of Chicago

106 *Survey of Current Practices in Postsecondary Graduate Retention,* Indiana Fiscal Policy Institute (January 2000) 15; Callahan, Gerald and Cynthia Benzing, "Assessing the Role of Internships in the Career-Oriented Employment of Graduating College Students," *Education and Training*, Vol. 46:2 (2004) 82-89. For the role of internships specifically in the hospitality industry which historically has experienced high rates of turnover in its upper management and skilled workers populations, see "Relationship Between Personality and Internship: Job Satisfaction of Hospitality Students in Taiwain" [Chinese], Hu, Meng-Lei, *Educational Research and Information*, Vol. 12, No.1 (2004), 103-132.

107 See the Fulbright Scholar Program Website at: http://fulbright.state.gov/ .

108 Jaschik, Scott, "Upping the Ante in Graduate Stipends," Inside Higher Ed Website (Feb. 8, 2007). www.insidehighered.com/news/2007/02/08/chicago.

109 "Web Site Links to Member Graduate & Professional Schools" Webpage, Ventures Scholars Program Website (2006). www.venturescholar.org/hs/gradintro.html.

graduate and professional students (including medical residents) who state their intention to seek employment in the state after graduation.[110]

[See also Recommendation 2.20.]

Recommendation 1.46. Create a low cost online program to develop proficiency in at least four important foreign languages (e.g., Mandarin, Spanish, French, German, etc.) to promote economic development, cultural knowledge, and tolerance.

This proposal would encourage business, industry, the Chamber of Commerce, and institutions of higher education to allow persons to take written and oral proficiency examinations at any time during the year to demonstrate their levels of language competency for "stackable certificates," for workforce preparation and advancement in globally-related corporations, and for promotion of national security.[111]

"It is no exaggeration to say that bolstering foreign language education for ensuing generations is vital to our nation's economic and national security....Our ability to compete in the global marketplace is dependent on our knowledge of other languages and cultures. Already, China claims to be the second largest English-speaking nation in the world."

U.S. Representative Rush Holt New Jersey (D)

Recommendation 1.47. Initiate new graduate programs to support new clusters and to attract talented individuals from other states and countries to South Carolina.

This is one aspect of the models which have been followed at the Research Triangle in North Carolina and at Georgia Tech in Atlanta and which have proved so successful in attracting some of the most talented teams of researchers and the most interesting research projects ongoing anywhere in the world in the life sciences, engineering, and bio-engineering.

[See also Recommendation 2.20.]

Recommendation 1.48. Increase opportunities for loan-forgiveness programs.

Broadening access to loan forgiveness for disciplines other than teacher education would encourage students to return to or stay in South Carolina to work. For example, the Pennsylvania Higher Education Assistance Agency helps eligible graduates of veterinary medicine or agriculture repay student loans when they return to Pennsylvania to work in a qualifying agriculture field.[112] Any loan forgiveness program will be integrated with the scholarship programs.

The SC Teachers Loan and the Career Changers Loan are loan forgiveness programs already in place in South Carolina. Under these programs, loans may be forgiven at the rate of 20% or $3,000, whichever is greater, for each full year of teaching in a critical subject or critical geographic area. For teaching in both a critical subject and a critical geographic area, the loan will be forgiven at the rate of 33% or $5,000, whichever is greater, for each year of full-time teaching.[113] These types of loan forgiveness programs should be developed to serve students in other high need or shortage disciplines.

One proposal currently under consideration within the South Carolina higher education community is a program of tax abatements that would provide $5,000 per year over ten years to distinguished graduates of designated critical needs programs who stay and remain employed in the state.[114]

[See also Recommendation 2.20.]

Recommendation 1.49. Develop a system scale-up plan.

The Action Plan sets an Aspirational Goal for 2030 that calls for much higher education levels that will be essential for South Carolina's long-term competitiveness. Specifying the nature of enrollments necessary to achieve those levels and how the state's colleges and universities will meet this longer range goal will require substantial analysis and planning. The Commission on Higher Education will convene college and university leaders to develop a plan for accommodating increased numbers of student participation in 2009.

A Congressional analysis of the World War II version of the G.I. Bill, which allowed many veterans to pursue higher education, showed that over 35 years to 1979, greater higher education levels increased economic output by nearly $294 billion and federal tax revenues by $105 billion—a return on investment of just under 7:1 (Numbers adjusted for inflation to 2008 dollars).

Subcommittee on Education and Health of the Joint Economic Committee. "A cost-benefit analysis of government investment in post-secondary education under the World War II GI Bill," (1990)

110 Walters, "South Carolina Commission on Higher Education Graduate/Professional Initiative," 3. This proposal envisions funding 20 stipends per year for a total cost of $200,000 per year, and students could hold them for up to four years.

111 "Why Foreign Language?", State Scholars Initiative (Western Interstate Commission for Higher Education) (September 2008), 1. www.wiche.edu/statescholars/research/tools/foreignLanguageBrief.pdf .

112 "Agriculture Education Loan Forgiveness Program" Webpage, Pennsylvania Higher Education Assistance Agency Website (2008). www.pheaa.org/loanforgiveness/Agriculture_Education_Loan_Forgiveness_Program.shtml.

113 "SC Teachers Loan Programs" Webpage, South Carolina Student Loan Website. [Accessed September 30, 2008.] www.scstudentloan.org/currentborrowers/loanprograms/scteachersloanprograms.aspx.

114 Walters, "South Carolina Commission on Higher Education Graduate/Professional Initiative," 4.

Goal Two
Increase Research and Innovation in South Carolina

Vision Statement

Fundamental demographic shifts in the state are creating enormous opportunities and risks by thoroughly reshaping important institutions across academia, industry, and government. New markets and competitors are being created by the globalization of a connected economy. From nano-materials to new energy sources, science is creating the raw material of the future at an unprecedented pace. Essential to South Carolina's future prosperity is developing a culture of creativity that attracts, develops, and retains the most talented people in the world who not only adapt to change, but lead it.

South Carolina must develop the infrastructure that supports the transfer of technology from academia to industry. The identification of new markets is often sparked by the informed intuition of knowledgeable individuals. The state needs more forums, online and in person, to cross-pollinate technical knowledge with market knowledge. The state needs to develop the eco-system of capital and professional services that is the foundation on which the best innovators and entrepreneurs build and develop their enterprises. Research on the leading edge of science is one driver of change, but infrastructure to support innovation and entrepreneurship should support the best and brightest researchers throughout the higher education system across the state.

If efforts to increase research and innovation in South Carolina are successful, the result is likely to be a revitalization of the South Carolina economy, as has occurred in the states of Georgia, Kentucky, and North Carolina following major state investment in academic research [see Forbes Business and Career rankings mentioned later]. Such a revitalization would have a considerable, positive impact on the state's K-16 education system. Not only will the state's school systems and institutions of higher education benefit from increased revenues, but they will have a critical role to play in such an economic reshaping. The state will require a better-educated and better-prepared workforce to accommodate all the complex needs of a knowledge-based economy. This effort will require unprecedented collaboration and partnerships between public and independent institutions of higher education, the K-12 community, the business community, and state government leadership.

Overview

According to a 2007 report of the premier academic research institutions in the United States published by the Center for Measuring University Performance (Arizona State University), "The value of university research to the nation is exceptional by every measure or study ever done."[1] While such a statement may appear obvious to anyone with even passing knowledge of the Bayh-Dole Act or the history of Silicon Valley, it may be useful to consider why university research and development (R&D) is now a commonplace component in state higher education plans[2] and why so many higher education institutions scramble for membership in prestigious organizations such as the American Association of Universities.[3]

In many if not most states, both public and independent institutions of higher education are now seen as a "mechanism to drive local economic development."[4] The Center for Measuring University Performance suggests that higher education laboratories and research facilities serve as a natural meeting ground for a variety of "secondary consumer" entities which have a vested interest in scientific progress and, just as importantly, have the ability to contribute funding to scientific discovery and commercialization: "Successful research universities find alternative, secondary consumers of research success who will pay the difference between the cost of research and the compensation provided by direct research sponsors in exchange for a wide range of benefits."[5]

The American Association of Universities refers to the collaboration of academic research and secondary research consumers as an "innovation matrix." When "universities, businesses, nonprofit organizations, government agencies, and individual innovators"[6] team up, not only is there usually a high economic return on investment, but a state's citizenry is served by improved health and well-being and increased educational aptitude.

In 1990, the state of Georgia engaged in such an innovation matrix: the Georgia Research Alliance (GRA), a non-profit organization which allows "business, research universities and state government to collaborate to build a technology-driven economy fueled by innovative university research." Georgia's $450 million investment has "leveraged an additional $2 billion in federal and private funding" and created more than "5,500 new science and technology jobs" and "more than 150 new companies."[7]

Another innovation matrix is the Kentucky Research Challenge Trust Fund (Bucks for Brains). Since 1997, the state of Kentucky has funded

1 Lombardi, John V., Elizabeth D. Capaldi and Craig W. Abbey, *The Top 10 American Research Universities 2007 Annual Report*, Center for Measuring University Performance, Arizona State University (2007), 6.

2 A March 2007 survey of ten state higher education plans found that "[n]ine of the ten statewide plans under review list as an objective the need to attract more research funding into the state, to increase grant competitiveness, and to develop institution-based technology transfer and commercialization that leads to statewide economic growth." The states surveyed included KY, OK, VA, TX, NJ, OH, TN, WA, UNC System, and UGA System. "Higher Education Statewide Plan Categories," SC Commission on Higher Education, Division of Academic Affairs & Licensing (March 17, 2008), 2.

3 "AAU Organization and Background" Webpage, American Association of Universities Website (2008), www.aau.edu/about/default.aspx?id=4002.
Presently, no South Carolina institution of higher education is an AAU member. Regional members include Duke University (NC), Emory University (GA), the University of Florida, the University of Virginia, the University of North Carolina at Chapel Hill, and Tulane University.

4 *The Top 10 American Research Universities 2007 Annual Report*, 3.

5 *The Top 10 American Research Universities 2007 Annual Report*, 5.

6 *Science as a Solution: An Innovation Agenda for the Next President*, American Association of Universities (March 2008), 1. Note: the phrase apparently was first coined by Paul Herbig in his book *The Innovation Matrix: Culture and Structure Prerequisites to Innovation* (Quorum Books, 1994).

7 "Born to Grow Georgia's Economy" Information Webpage, Georgia Research Alliance Website (2008). www.gra.org/AboutGRA/Origins/tabid/855/Default.aspx.

the program at $410 million[8] with very positive results to that state's academic and economic system. According to the National Science Foundation, the University of Kentucky ranked 52nd in the nation (of 630 institutions) in terms of total R&D expenditures between 2002-2005.[9] In 2007, external research grants at the University of Kentucky totaled $280 million compared to $122 million in 1997 (a 130% increase) and accounted for 8,824 jobs throughout Kentucky.[10]

The most well-known innovation matrix in the Southeast is the North Carolina Research Triangle, one of the world's foremost research parks.[11] The Research Triangle encompasses a three-county area in North Carolina (Durham, Orange, and Wake) where three major research universities are located: the University of North Carolina at Chapel Hill, Duke University, and North Carolina State University.

During the 1950s, the economic landscape in North Carolina was bleak: "The region's employment base was concentrated in low wage manufacturing industries (textiles, tobacco, furniture), marginal farming, state government, and higher education ... [G]enerally, a poorly educated resident labour force persisted."[12] However, in 1955, Governor Luther Hodges convened a group of political, education, and business leaders from around the state to strategize the reinvention of the North Carolina economy:

> In particular, the University of North Carolina's chemistry department, with a national reputation in organic and biochemistry, had a long tradition of supplying the laboratories of the nation's and the world's major chemical corporations with highly trained graduates. That, combined with North Carolina State University's highly regarded School of Textiles, explains the subsequent success in attracting and developing an early concentration of textile chemistry R&D labs in the region. Later, the strengths of the biomedical research faculty and facilities of Duke University and the University of North Carolina, and the strengths of North Carolina State University's agricultural sciences faculty became instrumental in attracting pharmaceutical and biotechnology research labs to the area. Likewise, the engineering schools at North Carolina State and at Duke, and the computer science department at the University of North Carolina paved the way for microelectronics R&D facilities to locate in the region.[13]

In the subsequent half-century, "more than 140 R&D facilities have located in the park, with over 40,000 employees....The Research Triangle started at below 90% of the average income for the U.S. in 1969, but was over 110% of the national figure by 2001. For average earnings per job, the region was below 85% of the national figure in 1969; by 2001 it was over 105%."[14] The region's population has boomed as well, from just under 300,000 in the mid-1950s to over one million in 2000.

The Georgia Research Alliance, the Kentucky Research Challenge Trust Fund, and the North Carolina Research Triangle are all stellar examples of successful innovation matrices. It should come as no surprise, then, that in its 2008 10th Annual Best Places for Business and Careers rankings, Forbes ranked Raleigh (NC) 1st, Lexington (KY) 5th, and Atlanta (GA) 6th.[15]

Over the past decade, South Carolina has engaged in the serious development of its own innovation matrix.[16] When the state ramped up investment into the research activities of its three senior research institutions through the SC Centers of Economic Excellence (CoEE) Program and the Research University Infrastructure Act (RUIA),[17] a vast array of "secondary consumers" leaped at the opportunity to collaborate with the world-renowned scientists being recruited to USC, Clemson, and MUSC.[18] These secondary consumers include state and local government (Richland County, City of Charleston, etc.), philanthropic foundations (Duke Endowment,[19] BlueCross BlueShield of South Carolina Foundation, etc.), corporations (BMW, Fluor, Michelin, Timken, etc.), and the federal government (U.S. Department of Energy, U.S. Department of Defense, etc.).

However, in today's very competitive world of academic research, South Carolina still has many regional public institutions to outcompete. According to the Center for Measuring University Performance's 2007 survey of the 196 major academic research institutions (institutions with $20 million or more in federal research expenditures), all three of South Carolina's senior research institutions scored considerably lower than other major public regional academic research institutions in measurement categories such as Total Research Dollars, Endowment Assets, and National Academy Members as shown in the following tables:

8 Baker, Elizabeth (Director of Planning; Office of Planning, Budget and Policy Analysis; University of Kentucky), email to Arik Bjorn (SC Commission on Higher Education), October 9, 2008.

9 "Academic Institutional Profiles" Webpage, National Science Foundation Website [Accessed October 8, 2008.] www.nsf.gov/statistics/profiles/data/ess_ranking.cfm#E008744.

10 *Endowment Match Program: 2006-07 Annual Report*, University of Kentucky (November 2007), 6. www.research.uky.edu/ca/rctf/endowment%20match%20program%2007.pdf

11 Goldstein, Harvey, "The Role of Knowledge Infrastructure in Regional Economic Development: the Case of the Research Triangle," *Canadian Journal of Regional Science* 28.2 (Summer 2005): 199(24). Academic OneFile. Gale. South Carolina State Library / DISCUS. 7 Oct. 2008. http://find.galegroup.com/itx/start.do?prodId=AONE. Gale Document Number:A151607306.

12 Goldstein, "The Role of Knowledge Infrastructure."

13 Goldstein, "The Role of Knowledge Infrastructure."

14 Goldstein, "The Role of Knowledge Infrastructure."

15 "Best Places For Business And Careers (Special Report)," *Forbes* Website (March 19, 2008). www.forbes.com/lists/2008/1/bestplaces08_Best-Places-For-Business-And-Careers_Rank.html. ("Topping the list for a second straight year is Raleigh, N.C. Business costs are 14% below the national average, and the area boasts one of the most educated labor supplies in the country, with 38% of the adult population possessing a college degree and 12% holding a graduate degree. Raleigh's secret is out, though, as people have been flocking to the area." Badenhausen, Kurt, "Best Best Places For Business And Careers," *Forbes* Website, March 19, 2008.) www.forbes.com/2008/03/19/best-career-cities-biz-bestplaces08-cx_kb_0319placeintro.html.

16 See the full list of recent South Carolina research and innovation initiatives in the September 15, 2008 *Leveraging Higher Education for a Stronger South Carolina: The Action Plan Framework*, 21.

17 The state investment thus far includes $190 million in the CoEE Program (2003-2009) and $250 million in RUIA bond funds (2004-2009). All state funds for both initiatives must be matched dollar-for-dollar from non-state sources. To date, matching pledges for the CoEE Program exceed $124 million, while non-state matching for RUIA projects exceeds $200 million.

18 See the South Carolina Centers of Economic Excellence Program Website at: www.sccoee.org.

19 The Duke Endowment contribution was a $21 million grant, "the largest award ever made by the 82-year-old private foundation's health care division" "Duke Endowment awards $21 million to HSSC," *Catalyst Online*, Medical University of South Carolina Website, August 18, 2006.

Table 2.1. South Carolina Senior Research Institution Total 2005 Research Funding Compared to Regional Competitors

	2005 Total Research Expenditures (in millions)	Ranking in Field of 196 Institutions
University of Florida	530.7	19
UNC-Chapel Hill	441	27
Georgia Tech	425	30
University of Georgia	316	45
University of Kentucky	306.7	46
North Carolina State University	302.6	48
University of Virginia	239	66
MUSC	**176.7**	**89**
Clemson	**175.1**	**91**
USC	**122.2**	**114**

Source: Center for Measuring University Performance at Arizona State University (2007).

Table 2.2. South Carolina Senior Research Institution Total 2006 Endowment Assets Compared to Regional Competitors

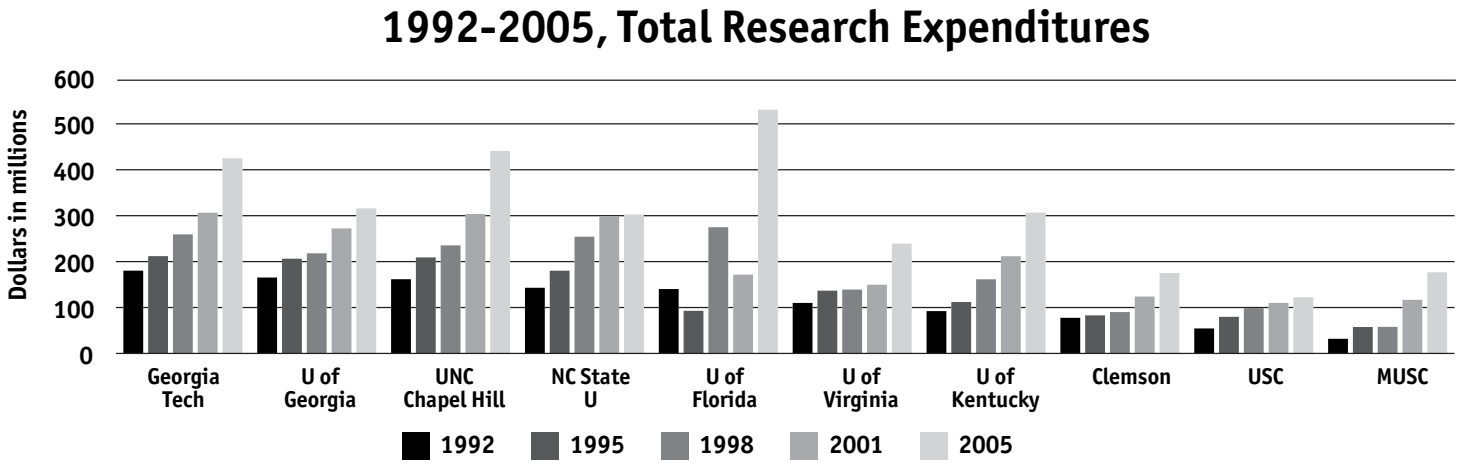
	2006 Endowment Assets (in billions)	Ranking in Field of 196 Institutions
University of Virginia	3.6	18
Georgia Tech	1.3	45
UNC-Chapel Hill	1.2	52
University of Florida	1.0	60
University of Kentucky	0.785	77
University of Georgia	0.52	115
North Carolina State University	0.412	139
USC	**0.385**	**142**
Clemson	**0.344**	**160**
MUSC	**0.115**	**330**

Source: Center for Measuring University Performance at Arizona State University (2007).

Table 2.3. South Carolina Senior Research Institution Total 2006 National Academy Faculty Members Compared to Regional Competitors

	2006 Endowment Assets (in billions)	Ranking in Field of 196 Institutions
UNC-Chapel Hill	34	12
Georgia Tech	28	36
University of Virginia	26	41
University of Florida	20	47
North Carolina State University	17	53
University of Georgia	9	69
University of Kentucky	2	122
USC	**2**	**122**
MUSC	**2**	**122**
Clemson	**0**	**194**

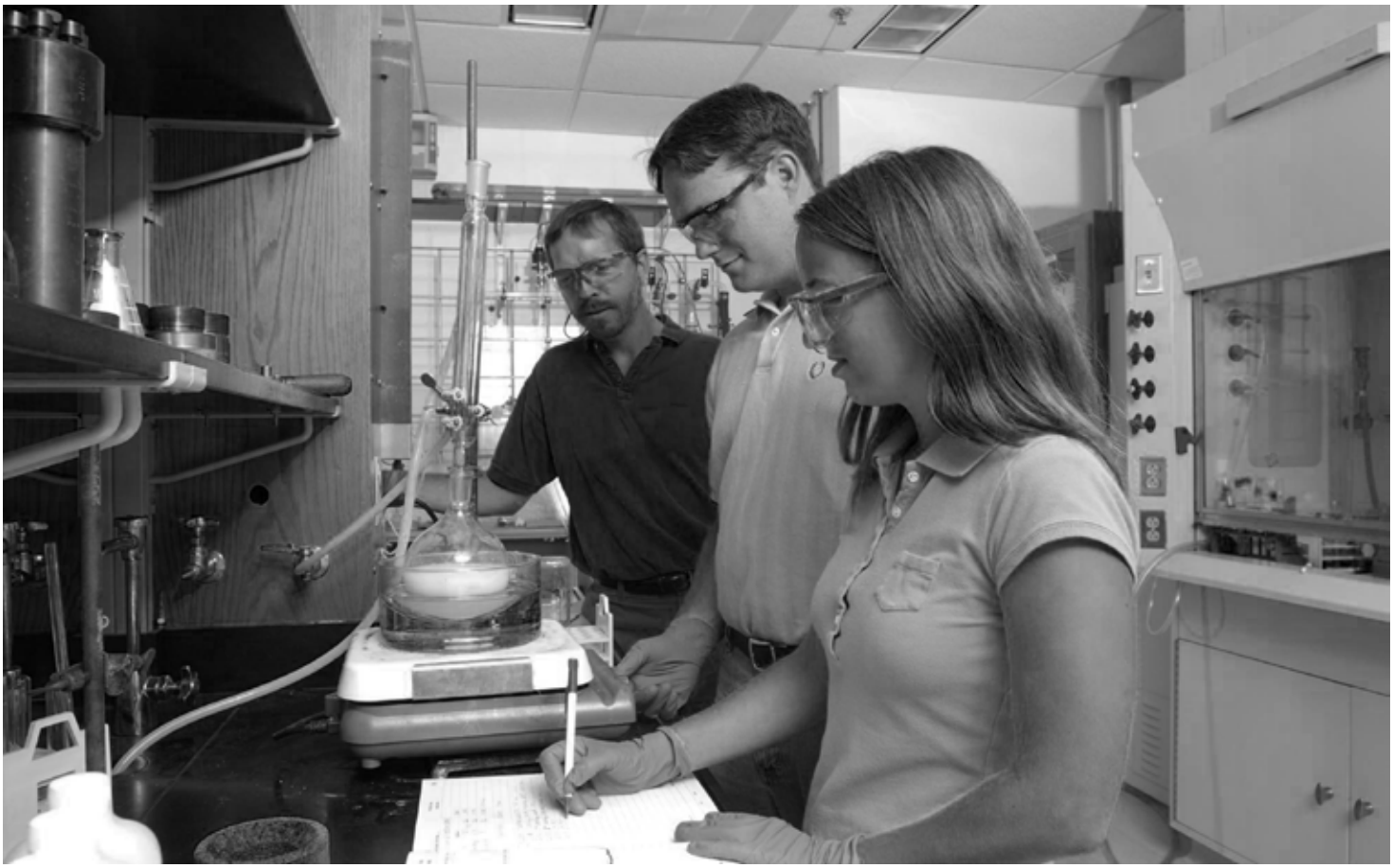
Source: Center for Measuring University Performance at Arizona State University (2007).



Source: National Science Foundation, Division of Science Resources Statistics

Figure 2.1. Total Research Expenditures

Fortunately, state political leaders have recently expressed full support for the continued building of the South Carolina knowledge-based economy through the development of academic research. In a letter to economic development community leaders, Speaker of the House Bobby Harrell, President Pro Tempore of the Senate Glenn McConnell, House Ways & Means Chair Daniel Cooper, and Senate Finance Committee Chair Hugh Leatherman univocally declared: "[T]he General Assembly will continue to initiate and promote policies which support the innovation and advancements in science, technology and commercialization." With such steadfast state support and with so many secondary consumers collaborating with the state's senior research institutions, the South Carolina innovation matrix is poised to become a highly-competitive national R&D sector.



Dr. Hanno Zur Loye (left) leads USC research on polymer nanocomposites.

Objectives and Recommendations to Achieve Goal Two

Objective 1: Create a Culture of Discovery in Order to Establish a Competitive Knowledge-based Innovation Matrix in South Carolina

Recommendation 2.1. Create opportunities for communication and "cross-fertilization" between and among institutions of higher education and the state's major industries to encourage idea sharing, on-site explorations, and formal partnership agreements.

- Add industrial liaison officers in Economic Development offices at higher education institutions to promote enhanced relationships with strategic business and industry research clusters.
- Fund entrepreneur-in-residence or professor-of-the-practice programs where industry employees or recent retirees are embedded within an institution.
- Increase awareness of the value of basic research as a mechanism to stimulate broad interest in creativity which will lead to concrete applications.
- Identify targeted areas for pairing discovery and applied technologies and offer incentives to nurture them.
- Encourage research vice presidents to visit regularly each of the other research universities, the four-year comprehensive institutions, and the technical colleges to facilitate collaboration.
- Encourage researchers to accompany university administration members and development officers to meetings with private businesses and industries.
- Identify researchers within institutions who are especially adept at interaction with business and industry, and designate these researchers as communications liaisons to other institutional researchers.
- Maximize opportunities for people in industry and academia to get to know each other and work together because the state needs to bring together people in the industry who know the market with those in academia who know the technology.
- Encourage the co-location of faculty and students from all levels of higher education with industry professionals and entrepreneurs.
- Create comprehensive, multi-institutional, interdisciplinary research institutes designed to attract external funding. These institutes should focus on areas where there is great potential for discovery at the intersections of disciplines, cultures, and institutions. To aid the creation of such institutes, the state should develop a differential funding model for joint programs with a research emphasis relevant to the state's economy.

Recommendation 2.2. Enact appropriate regulatory relief to enhance innovation and promote research.

- Review and revise state hiring, compensation, and purchasing regulations relative to university research and education operations.
- Provide regulatory relief related to the construction of new buildings.
- Minimize/eliminate legal barriers to technology transfer.
- Provide regulatory relief for intellectual property issues; review and revise intellectual property policies so they do not unnecessarily constrain or restrict technology transfer.
- Provide a clear mechanism for addressing and managing conflict of interest issues relative to the use of university space to nurture technology transfer.
- Provide regulatory relief to allow universities to compete with and be attractive to corporate partners.
- Provide tuition waiver and reciprocity for faculty dependents.

[See Recommendation 2.23.]

Recommendation 2.3. Engage more undergraduates in research.

- Encourage research by undergraduate students through partnerships across institutions.
- Pursue additional Research Experiences for Undergraduates (REU) grants through the National Science Foundation.
- Promote participation in organizations such as the Council for Undergraduate Research (CUR) and National Conferences on Undergraduate Research (NCUR).
- Foster interdisciplinary projects within individual institutions, and undergraduate collaborations which represent multiple institutions.
- Increase opportunities for undergraduate research through faculty-mentored research projects at two- and four-year institutions.
- Ensure that tenure and promotion policies affirm the value of research with students as appropriate.
- Create undergraduate and graduate student incubators that could lead to spin-offs.
- Develop a mechanism to provide small grants for research to faculty at the comprehensive teaching institutions for amounts no greater than $20,000 per year in direct costs.

Recommendation 2.4. Produce greater numbers of teachers in all critical needs areas, especially in Science, Technology, Engineering and Mathematics (STEM) disciplines, including more male and minority teachers.

- Expand pre-collegiate teacher recruitment programs such as ProTeam and Teacher Cadets.
- Increase grant and scholarship opportunities in programs such as Teaching Fellows and the Program for the Retention and Recruitment of Minority Teachers.
- Expand programs similar to "Call Me MISTER" and create new programs aimed at attracting males and minorities.
- Provide state matching funds for the federal grant for the South Carolina Alliance for Minority Participation Program.

[See Recommendations 1.8 and 3.28.]

Recommendation 2.5. Integrate entrepreneurship into curricula at colleges and universities (especially in programs in the liberal arts and STEM disciplines).

- Expand entrepreneurship learning opportunities within two- and four-year institutions through credit and non-credit offerings, including certificates (pre-baccalaureate, baccalaureate, and post-baccalaureate).

- Establish a curriculum on entrepreneurship.
- Establish centers of entrepreneurship and innovation.
- Connect entrepreneurship programs with other academic programs; e.g., engineering, biomedicine, etc.

Recommendation 2.6. Develop a system of "Research Sabbaticals" for faculty from comprehensive teaching institutions.

- Promote administrative internships/fellowships/sabbaticals to assess best practices outside the state, e.g., a shadowing program similar to that offered by the American Council on Education.
- Increase opportunities for summer research for faculty from comprehensive four-year institutions, including but not limited to at research universities and business and industry.
- Establish in-state sabbatical programs for researchers across institutions.
- Develop formalized sabbatical programs targeting specific industries.
- Encourage faculty at comprehensive institutions to perform research at the research institutions during sabbaticals.

Objective 2: Optimize the Process of Technology Transfer to Create Jobs and Develop New Industry in South Carolina

Recommendation 2.7. Create a state model for formal agreements between institutions of higher education and the state's business and industry to facilitate shared research and reduce barriers to the commercialization of resulting discoveries and inventions.

- Foster presence of "support industries."
- Raise awareness of the roles of business and industry in encouraging campus participation in technological development that would be transferrable.
- Align research emphases with the needs of business and industry.
- Encourage and support collaboration between faculty and Centers for Entrepreneurship and similar entities in order to foster new venture creation.

"Since 1980, over 2,000 companies based on university and National Institutes of Health research have been founded. The V-chip, the PSA test for prostate cancer, hip implants, Taxol are but a few of hundreds of discovery-to-commercial product success stories. University Technology Transfer was also critical in developing the science-based economies of the North Carolina Research Triangle Park and California's Silicon Valley. In other words, University Technology Transfer was—and remains — a key building block for transforming businesses and industry."

W.C. Hood, Executive Director, MUSC Foundation for Research Development
2006-2007 SC Centers of Economic Excellence Program Annual Report to the SC Budget & Control Board

Recommendation 2.8. Review[20] and/or revise Intellectual Property (IP) policies based upon successful models at other research institutions (e.g., Georgia Tech, North Carolina State University, and the University of Kentucky[21]).

- Establish a network of programs to encourage statewide technology transfer of South Carolina-derived technologies/patents (e.g., Maryland technology transfer consortium[22]).

Recommendation 2.9. Broaden the scope of the South Carolina Research Authority (SCRA) and SC Launch![23] to encourage and support research and technology transfer across all South Carolina institutions of higher education.

- Create a virtual, web-based Intellectual Property office for the independent and smaller public universities.
- Establish an organization that serves as a state resource for research development, technology transfer, seed funding, business planning, and marketing of intellectual property (e.g., North Carolina Biotechnology Center[24]).
- Provide a sufficient number of experts and staff to assist researchers in the patenting process, with particular focus on multi-institutional (public/public, public/private) intellectual property and consortiums.
- Increase the number and quality of grant submissions.
- Encourage the development of formalized consortia, advisory networks, or councils that will optimize the process of technology

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20 The Medical University of South Carolina (MUSC) reviewed national programs and revised its IP policy last year.

21 Georgia Tech IP Policies: http://otl.gtrc.gatech.edu/documents/GIT_Policy_IP_from_Faculty_Handbook_2006-04.pdf (see Section 50) and http://otl.gtrc.gatech.edu/sect/industry/policies_procedures
North Carolina State University IP policies and forms: www.ncsu.edu/ott/resource.html
Kentucky IP Policy: www.adec.edu/intellectualproperty/uky.html; Kentucky IP and Commercialization Faculty Guide (Administrative Regulations): www.econdev.uky.edu/ip/ars.html; and forms www.econdev.uky.edu/ip/forms.html.

22 The Maryland Technology Transfer Offices Partnership, or MDTTO, is a technology transfer consortium focused on increasing collaboration between university transfer offices not only to commercialize some of the most innovative technologies in the nation, but also to do a better job of working together to make sure people know about innovative technologies.
"MDTTO Partnership Newsletter" University of Maryland, Office of Technology Commercialization Division of Research. [Accessed October 7, 2008.] www.otc.umd.edu/News/mdtto.html.
Also see the Federal Laboratory Consortium (FLC) for Technology Transfer at: www.federallabs.org/.

23 SC Launch! provides qualifying companies with commercialization support and guidance and up to $200,000 in seed funding.
SC Launch! Website. [Accessed October 7, 2008.] www.sclaunch.org/.

24 According to the North Carolina Biotechnology Center Website, the mission of the center is to "provide long-term economic and societal benefits to North Carolina by supporting biotechnology research, business and education statewide." The Biotechnology Center works to strengthen the research capabilities of North Carolina's companies and universities by avoiding duplication of effort and using limited resources more efficiently. The Biotechnology Center receives most of its funding from the General Assembly. For example, the state appropriation for 2006-2007 was $13.1 million and the budget for the center that year was $17.6 million. Since 1984, the Biotechnology Center has invested more than $187 million in state monies to develop biotechnology statewide. That investment includes a range of grants and loans for young companies and education training programs. As a result of North Carolina's investment in biotechnology, the state ranks third in the nation in the number of biotechnology companies according to Ernst and Young's 2007 industry survey.
North Carolina Biotechnology Center Website. [Accessed October 7, 2008.] www.ncbiotech.org/.

transfer and connections with industry at the institutional level (e.g., Maryland technology transfer consortium[25]).

- Create a core team of experienced, perhaps retired, business executives to advise start-up companies.
- Establish a network of programs to encourage statewide technology transfer of South Carolina-derived technologies/patents.
- Support the growth of infrastructure that promotes entrepreneurship, including incubators, angel groups, InnoVenture, entrepreneurial support organizations, etc.
- Establish a business relationship with an Intellectual Property (IP) development group that actively vets Intellectual Property to set development strategies.
- Facilitate venture capital funding for incubator space and related activities.
- Identify state and private support to provide seed funding for more start-ups across all colleges and universities.

Recommendation 2.10. Establish Enterprise Campuses at technical colleges statewide.

- Commercialize ideas developed at the research universities and attract knowledge-based companies to South Carolina through public-private partnerships.
- Accelerate business growth and ensure a ready workforce by co-locating companies with educators and students.
- Establish an effective mechanism to grow and attract knowledge-based companies to all parts of the state.

Objective 3: Enhance Research and Innovation Partnerships Among all Colleges and Universities and Among Colleges, Universities, and the Private Sector, Resulting in Increased Numbers of State and Regional Research Programs and Initiatives

Recommendation 2.11. Encourage increased communication, shared programs, and formal partnerships among institutions of higher education.

- Target consortia in high impact areas.
- Establish state-industry funded programs similar to the Defense Advanced Research Program Agency,[26] where institutional partnerships are required to participate.
- Encourage joint research proposals and collaborative partnerships through augmented funding.
- Encourage and support collaboration among institutions and between faculty in four-year institutions and research universities.
- Form connections among sectors when working with industry by bringing together researchers and technicians to meet business needs.
- Sponsor an annual technology transfer conference for all universities to attend in order to foster further communication between and among institutions; to identify new technologies statewide; and to attract the attention of business, industry and venture capital entities.
- Consider a "postdoc sharing" program whereby postdocs act as conduits for sharing discovery and knowledge.
- Explore how institutions with federal and state liaisons can work with those which do not have such liaisons to use those resources more effectively.

Recommendation 2.12. Create or use existing local higher education/ industry advisory boards to identify potential research, collaboration, and consulting opportunities.[27]

- Use the technical college business advisory groups as natural forums for discussing research topics (i.e., include the four-year institutions and research universities in these discussions).
- Encourage small businesses and entrepreneurs to look to local institutions of higher education for technical assistance for real world problems and for local institutions to reach out and seize those opportunities to integrate practical applications with theory.
- Use industry problem areas as case studies in business, engineering and entrepreneurship courses and programs.
- Develop college and university outreach or company visitation programs with the purpose of meeting with industry management personnel and others to learn what technical issues and opportunities may be facing South Carolina companies that academia could support or become involved in.
- Connect private sector innovation back to the universities and work with groups like SPAWAR[28] to make the connections to universities.
- Establish state workshops and roundtables to promote better understanding of university/college and industry cultures so participants in each understand the drivers and therefore the barriers to collaboration.
- Provide opportunities for people from the private sector to be university guest lecturers or seminar leaders as appropriate.
- Conduct a series of strategic planning meetings with targeted private sector companies to develop college/university roadmaps for joint investment programs.
- Conduct "Industry Days" to capture research needs and identify challenges and opportunities.

25 The Maryland Technology Transfer Offices Partnership, or MDTTO, is a technology transfer consortium focused on increasing collaboration between university transfer offices not only to commercialize some of the most innovative technologies in the nation, but also to do a better job of working together to make sure people know about innovative technologies. "MDTTO Partnership Newsletter" University of Maryland, Office of Technology Commercialization Division of Research. [Accessed October 7, 2008.] www.otc.umd.edu/News/mdtto.html http://www.otc.umd.edu/News/mdtto.html."

26 The Defense Advanced Research Projects Agency (DARPA) manages and directs selected basic and applied research and development projects for the Department of Defense, and "pursues research and technology where risk and payoff are both very high and where success may provide dramatic advances for traditional military roles and missions."
Defense Advanced Research Projects Agency Website. [Accessed October 7, 2008.] www.darpa.mil/.

27 The college presidents attending the American Council on Education Roundtable noted that innovation "emerges through the interaction of people – and the more diverse the interaction of people – the more diverse the interaction, the greater the potential for progressive action."
The Times Demand Innovation, 13.

28 As part of its mission, the Space and Naval Warfare Systems command (SPAWAR) delivers and supports business internet technology (IT) capabilities.
SPAWAR Website. [Accessed October 7, 2008.] http://enterprise.spawar.navy.mil/body.cfm?type=c&category=18&subcat=1.

- Develop programs for private sector partners to work with colleges and universities to develop "think tank" opportunities.

[See also Recommendation 3.6.]

Recommendation 2.13. Provide creative incentives to industries to collaborate with SC research institutions.

- Provide state match of private industry R&D investment at research institutions.
- Provide tax credits that will lure industries to relocate R&D activities to SC.[29]
- Create grant programs to encourage companies to partner with research institutions.[30]
- Provide additional incentives for start-ups and relocation of small companies such as:
  - Applying existing SC state tax and other incentives (e.g., employee training) to companies with fewer than 100 employees if these companies have qualified for funding from SC Launch! or a SC-sponsored venture capital firm
  - Matching/double-matching Small Business Technology Transfer Program Reauthorization(STTR) and/or Small Business Innovation Research (SBIR) funds received by a company[31]
  - Providing free rent or incubator space for 6-12 months
  - Financing leasehold improvements at subsidized rates
  - Providing tax breaks to large businesses in SC that collaborate with or support emerging companies, e.g., R&D, manufacturing, IT support, etc.
  - Supplementing health care benefits
  - Providing legal and accounting assistance at reduced rates
  - Enabling industrial revenue bond issuance to assist with plant construction and machinery/equipment purchase

[See also Recommendation 3.6.]

Recommendation 2.14. Expand existing and/or develop new STEM programs which reflect the economic needs of the state.

- Develop programs in engineering modeling; computational and instrumentation methods; and systems engineering. Expand and increase the number of graduates in computer, industrial, mechanical and electrical engineering, and engineering technology.
- Develop Professional Science Master's Programs where appropriate.[32]
- Develop an articulated program of earned college credits based on work with key industries, possibly linked to the stackable certificates concept advocated for adult learners. [See Recommendation 1.34.]
- Enhance existing graduate programs to include applied, industrial practica.
- Connect technical programs with business and entrepreneurship programs; e.g., biotechnology with business, engineering and entrepreneurship, etc.

[See also Recommendations 2.17, 2.20, and 3.28.]

Recommendation 2.15. Encourage businesses, colleges, and universities to apply for more Small Business Innovation Research (SBIR) and Small Business Technology Transfer Program (STTR) grants through the South Carolina Department of Commerce.[33]

29 Several states offer tax credits for research and development (R&D). Similar to the federal credit, Georgia's R&D tax credit is a ten percent credit on expenditures in excess of the base amount, but unlike the federal credit "the base amount is defined to be a product of the firms' taxable net income in the current year and the average ratio of qualified research expenses to its taxable income for the past three years." Additionally, North Carolina's credit is five percent of excess qualified R&D expenditures or 25 percent of the federal alternative R&D credit amount. Also, as of May 1, 2005, North Carolina implemented a non-incremental tax credit of one to three percent of qualified research expenses and 15 percent of research expenses for research conducted aTax Incentives for Research and Development Activities." State Tax Notes, Vol. 44, No. 3, April 16, 2007, 164-166. Ohio provides a nonrefundable tax credit (equal to 7% of the excess amount of Qualified Research Expenses) against the corporate franchise tax and is designed to encourage corporations to invest in increased research and development activities. Business Incentives Tax Credits Webpage. Ohio Department of Development Website. http://www.odod.state.oh.us/EDD/Tax_Credit.htm. Wheeler, Laura. "A Review of State".http://www.odod.state.oh.us/EDD/Tax_Credit.htm .

30 Many states offer grant programs designed to foster collaboration. For example, Texas established the Emerging Technology Fund, which includes the research grant program that provides matching grants to companies that partner with state universities on emerging technology projects. Florida created The Florida High Tech Corridor (FHTC) Council which has grant programs designed to stimulate industrial R&D activities conducted as joint projects between university faculty and industry partners by awarding grants between $20,000 and $100,000 in value or using state grant dollars to match federal grants from the Small Business Innovation Research (SBIR) or Small Business Technology Transfer (STTR) programs.
Wheeler, Laura, "A Review of State Tax Incentives for Research and Development Activities," 170-171.

31 "The U.S. Small Business Administration (SBA) Office of Technology administers the Small Business Innovation Research (SBIR) Program and the Small Business Technology Transfer (STTR) Program. Through these two competitive programs, SBA ensures that the nation's small, high-tech, innovative businesses are a significant part of the federal government's research and development efforts. Eleven federal departments participate in the SBIR program; five departments participate in the STTR program awarding $2 billion to small high-tech businesses."
Small Business Innovation Research Website. www.sbir.gov/about/index.htm.

32 For example, the University of Connecticut has Professional Master's Degrees in Science and Mathematics. These degree programs "are hybrids between the traditional coursework degree (emphasizing formal theoretical coursework) and the traditional thesis degree (emphasizing original research project), incorporating the best of both."
"A New Type of Training for Careers in the New Century." University of Connecticut Website. [Accessed October 7, 2008.] www.smasters.uconn.edu/.
Also see www.cgsnet.org/portals/0/pdf/GR_GradEdAmComp_0407.pdf for the Council of Graduate Schools' report, *Graduate Education: The Backbone of American Competitiveness and Innovation,* which describes a Professional Master's Degree as a promising practice of innovative collaboration.

33 The Small Business Innovation research (SBIR) program "is a set-aside program for domestic small business concerns to engage in Research/Research and Development (R/R&D) that has the potential for commercialization."
"Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs" Webpage. US Department of Health and Human Services Website. http://grants1.nih.gov/grants/funding/sbirsttr_programs.htm.
The STTR Program requires research partners at universities and other non-profit research institutions to form a collaborative relationship with the small business concern; "at least 40 percent of the STTR research project is to be conducted by the small business concern and at least 30 percent of the work is to be conducted by the single, 'partnering' research institution."
"Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs" Webpage. US Department of Health and Human Services Website. http://grants1.nih.gov/grants/funding/sbirsttr_programs.htm.
The NC Small Business and Technology Development Center serves as an example of a state entity designed to facilitate interaction with the SBIR/STTR programs.
"SBIR/STTR" Webpage. The NC Small Business and Technology Development Center Website. www.sbtdc.org/technology/sbirsttr.asp.
The SBIR Assistance Program for the State of Georgia, located at the Georgia Institute of Technology, is an example of a campus-based SBIR support entity.
"SBIR – Overview" Webpage. Georgia Tech Enterprise Innovation Institute Website. www.innovate.gatech.edu/Default.aspx?alias=www.innovate.gatech.edu/sbir.

Recommendation 2.16. Establish a South Carolina Energy Independence Consortium to promote collaboration and the sharing of energy-related expertise and to research and develop innovative energy systems through the South Carolina Energy Office.[34]

- Base the model on the recently established Florida Energy Systems Consortium[35] and draw on the experience of Health Sciences SC.[36]
- Coordinate and increase collaborative interdisciplinary energy research.
- Provide a state resource for objective energy systems analysis.
- Develop education and outreach programs to prepare the workforce and inform the public.
- Solicit and leverage state, federal, and private funds in sustainable energy fields.

The Women of TI [Texas Instruments] Fund is working to close the gender gap in STEM professions. The program's mission is to increase the number of females graduating from high school who are entering a university-level technical degree program by giving them the tools and support they need to pursue careers in STEM professions. In 2007, 134 female participants took the AP Physics exam, a 132% increase from 2000. In addition, 43% of participants taking the AP Physics exams passed the test, a 290% increase from 2001. Furthermore, females who attended an AP physics camp and had teachers that utilized the gender equity practices passed the exam at the same rate as male students. Coincidentally, the pass rate of male students who had teachers that utilized the gender equity practices also increased. The Caruth Institute for Engineering Education at Southern Methodist University (SMU) has initiatives such as the Infinity Project, Visioneering, the Gender Parity Initiative, and SMU Engineering Summer Camps for Girls and Seniors, which assists in the development of innovative science, technology, engineering and math educational programs.

Objective 4: Recruit and Retain the Brightest Innovators to Create Long-term Intellectual Infrastructure in South Carolina

Recommendation 2.17. Recruit and retain more students in the state's existing science, technology, engineering, and mathematics (STEM) programs to facilitate increased enrollment.[37]

- Increase participation in existing programs.
- Reallocate institutional resources accordingly.
- Identify business and industry partners.

[See also Recommendations 2.14, 2.20, and 3.28.]

Recommendation 2.18. Revitalize and expand the universities' research infrastructure.

- Issue a second round of bonds under the Research University Infrastructure Bond Act to expand research facilities which are at capacity.
- Provide major equipment grant opportunities.
- Fund and build new physical space and catch up on deferred maintenance for existing research space.
- Provide a one-time, multimillion dollar investment to purchase the most exciting new technology and instrumentation to enhance research core support services.
- Increase computational connectivity and complete funding of SC Light Rail to link all higher education institutions.
- Support and fully fund with recurring dollars the Partnership Among South Carolina Academic Libraries (PASCAL), which is used by faculty in their research.
- Explore by working with appropriate stakeholders the development of a major transportation hub in the state which is essential to enhance corporate partnerships and venture investment and to attract and retain researchers.
- Position and support the state as a destination for significant national and international science and technology conferences.
- Develop a program of industry-funded faculty consulting.[38]

[See also Recommendations 1.21, 3.3, and 4.2.]

34 The Washington Advisory Group, consultants conducting an evaluation of the CoEE Program during August – December 2008, believes South Carolina has a significant opportunity to leverage its current expertise in this area.

35 Hoover, Aaron. "With $50 million, Florida universities to focus on renewable energy," University of Florida News Website, 26 June 2008. http://news.ufl.edu/2008/06/26/energy-consortium/.
"Florida Energy Systems Consortium Center of Excellence Proposal." Submitted by the University of Florida, University of Central Florida, University of South Florida, and Florida State University. 3 Dec. 2007. www.research.fsu.edu/ieses/documents/Volume%20I%20CoE%20Technical%20Proposal.pdf.

36 Health Sciences South Carolina is "a dynamic statewide entity that includes Clemson University, Greenville Hospital System University Medical Center, Palmetto Health, the Medical University of South Carolina, the University of South Carolina and Spartanburg Regional Healthcare System." The mission of this entity is to improve the health and economic well-being of the state through a coordinated strategy to advance research and education.
Health Sciences South Carolina Website. [Accessed October 7, 2008.] www.healthsciencessc.org.

37 The Goal Two Task Force conducted a survey to determine the capacity of existing programs in October 2008. In general, if demand remains constant, the state's public baccalaureate institutions have adequate capacity to accommodate students with only three reported exceptions (Clemson University, South Carolina State University, and USC-Upstate). However, if demand increases as expected because the state plan recommends several strategies to increase the number of students in the STEM disciplines, then most public institutions will not have adequate faculty, laboratories, or equipment to support expanded programs.

38 Industry has become less willing to pay the full cost of research at higher education institutions, but it is willing to pay an institution for access to its faculty. See "MIT: The Impact of Innovation," (March 1997) which was prepared by the BankBoston Economics Department.
http://web.mit.edu/newsoffice/founders/Founders2.pdf.
Also see Louis G. Tornatzky's, "Building State Economies by Promoting University-Industry Technology Transfer," a report for the National Governors' Association.
www.nga.org/Files/pdf/UNIVERSITY.PDF.

Recommendation 2.19. Develop or expand programs to increase the number of women and minorities in engineering, math, and science.[39]

- Establish centers to recruit and retain under-represented populations to existing science and engineering programs.[40]
- Develop special programs to target women and minorities early, beginning in middle school so that academically they can prepare to major in engineering, math, or science in college.[41]
- Increase recruitment efforts targeting high school juniors.[42]
- Increase summer transition programs.[43]
- Develop or expand mentoring programs.[44]
- Create or expand programs designed to recruit and prepare women and minorities for graduate-level work.

[See also Recommendations 2.14, 2.17, 2.20, and 3.28.]

The major reason for increased demand for graduate/professional degrees is the fact that advanced abilities and knowledge are becoming a required entry point for many professions. For example, in health care, the entry-level degree in Pharmacy, Physical Therapy, and Audiology has moved to the doctorate and demand for physicians is soaring in almost every specialty area. Additionally, although not formally required, professionals in areas such as business and engineering as well as teachers are usually expected to undertake an advanced credential early in their careers.

Recommendation 2.20. Create innovative scholarship programs and pathways to attract and retain top-notch graduate students.

- Consider the possibility of legislative incentives (tax credits, tuition rebates for degree completion, etc.) to encourage students to earn an academic certificate or degree—especially for students who remain in South Carolina for a certain period of time following degree completion.[45]
- Provide entrepreneurial opportunities for graduate students (e.g., incubator space; business support).
- Create technical innovation scholarships.[46]
- Create competitive scholarships for applied research in technical fields.

39 As the enrollment in higher education becomes increasingly female (in 2007, 60% of students enrolled in public and independent South Carolina institutions were female), the degree production in the STEM disciplines may be further compromised unless these disciplines respond aggressively to attract, recruit and retain more women. For example, the total number of degrees awarded in the STEM disciplines decreased from 2408 during 2005-2006 to 2352 in 2006-2007. In addition to the decrease in total degrees awarded, in 2006-2007, males received 528 more bachelor's degrees from public institutions in the STEM disciplines than females whereas in 2005-2006, males received 386 more bachelor's degrees from public institutions in STEM disciplines than females. Such an increase in disparity is significant given the number of degrees awarded.
2008 South Carolina Higher Education Statistical Abstract. South Carolina Commission on Higher Education (July 2009), 29. www.che.sc.gov/Finance/Abstract/Abstract2008web.pdf. Degrees awarded data obtained from CHEMIS.

40 For example, The Center for the Enhancement of Engineering Diversity (CEED) at Virginia Tech, established in the fall of 1992, provides encouragement and support to engineering students and focuses on the under-represented population. Center for the Enhancement of Engineering Diversity Webpage. Virginia Tech Website. www.eng.vt.edu/academics/ceed.php.

41 Math, Science and Engineering: It's a Girl Thing!© at Clemson University targets young women entering the 8th grade and is intended to give these students a better introduction to the science, engineering and mathematics disciplines and the opportunities they offer. The young women participate in a one-week camp in which noncredit mini-courses in engineering and science are taught by Clemson professors. In the minicourses, the students have the opportunity to experience collaborative and hands-on learning through practical applications of math and science.
Project WISE Website. Accessed October 20, 2008. www.ces.clemson.edu/wise/programs/projectwise/index.html.

42 Purdue offers a Preview Day (usually sponsored by engineering companies) for high school juniors to give these students the chance to get an overview and specific information on the various areas of engineering and to learn more about the field and the different careers one can pursue with a degree in engineering. During this preview, there are lectures and demonstrations presented by professors and Purdue students. Students also receive information about the first-year engineering program, admissions procedures, residence halls and careers in engineering.
"Purdue Women in Engineering Preview Day set for April 11." Purdue University Website. April 1, 2005. http://news.uns.purdue.edu/html3month/2005/050401.Holloway.previewday.html.

43 North Carolina State University's Summer Transition Program (STP) is a significant recruiting activity available to admitted high school minority students considering NC State as their undergraduate engineering school. Participants spend five weeks during the summer academic session enrolled in their initial math course while also attending weekly industrial visits and workshops on a variety of topics.
"For Minority Engineering Programs at NC State, It's All About Success" NC State University College of Engineering Website (August 1, 2000).
www.engr.ncsu.edu/news/news_articles/mep.profile.html.

44 North Carolina State University has a Student Advancement and Retention Teams Program (START) in which all entering minority freshmen are assigned a peer mentor who shares the responsibility for social and academic development of the mentees. Mentors, who are upper-division minority engineering students, are selected and trained by the START program. Mentors meet regularly with their mentees to provide guidance in academic areas as well as to help them transition to college-life. While the program is intended to ease the transition into their engineering education and be a notable support system for minority engineering students, it also develops leadership and mentoring skills in upper-division minority students.
"For Minority Engineering Programs at NC State, It's All About Success" NC State University College of Engineering Website (August 1, 2000). www.engr.ncsu.edu/news/news_articles/mep.profile.html.

45 Several states provide incentives for graduates who remain in state. For example, in 2007, the State of Maine passed legislation which provides tax credits to lower the cost of student loans for college graduates who decide to stay and live in Maine. Tax credits are capped at $2,100 per year and will last for 10 years or until the recipient moves out of state.
M.R.S. Title 20-A, Chapter 428-C: "Job Creation Through Educational Opportunity Program." http://janus.state.me.us/legis/statutes/20-A/title20-Ach428-Csec0.html . See also: http://opportunitymaine.org/index.php.]
Similarly, in 2008, Ohio legislators announced intentions to draft legislation to give tax credits to college graduates who stay in the state following graduation. The plan would offer tax credits over a 10-year period totaling $5,000 for completing an associate's degree, $20,000 for completing a bachelor's degree, and $30,000 for a master's degree or higher.
Marshall, Aaron, "Tax Credits Proposed for College Graduates Who Stay in Ohio," *The Plain Dealer Bureau* (August 21, 2008).
www.cleveland.com/news/plaindealer/index.ssf?/base/news/1219307676150810.xml&coll=2.

46 The state could create a scholarship similar to the one offered by the Institute of Industrial Engineers that is awarded to a student who has provided an innovative technical contribution to the industrial engineering profession that may be recognized in any of several forms, including theory, design, application, implementation, and leadership. To be eligible for the scholarship, the student must be distinguished in one of the following ways:

Significantly expanded the body of knowledge associated with a functional area of industrial engineering through theoretical development or innovative application constituting a major new concept, tool, or technique;
Established or adapted, through work and reputation, a body of knowledge new to industrial engineering such that it is accepted theoretically or successfully implemented in industry, thus expanding the traditional IE universe; and
Provided exceptional technical leadership in a major interdisciplinary project.

"The Award for Technical Innovation in Industrial Engineering." Institute of Industrial Engineers Website. [Accessed October 8, 2008.]
www.iienet.org/Details.aspx?id=605.

Clemson University utilizes innovative programs to encourage female participation in the fields of science, math and engineering. Project WISE (Women in Science and Engineering) is a week-long summer camp for 8th grade girls which provides exposure to the fields of science and engineering in creative ways. The WISE Experience provides incoming female freshmen who intend to major in the science, math or engineering fields the opportunity to spend a week on campus during the summer. During that week, they are introduced to their fields, to campus life and to one another in order to encourage success in college. "It's a Girl Thing" is an ongoing program between Clemson and a local school district which encourages female middle school interest in science, math and engineering. The program pairs middle school girls with "Big Sister" mentors who are Clemson students majoring in a STEM discipline.

- Allocate funds to use as matching funds to enable institutions to compete for federally designated research centers and grants.[47]
- Increase graduate students in Science, Technology, Engineering and Mathematics (STEM) disciplines.[48] [See also Recommendations 2.14, 2.17, and 3.28.]
- Create an Innovation Scholars Program,[49] which would provide enhanced stipends to exceptional graduate and professional students (including medical residents) who state their intention to seek employment in the state after graduation.
- Increase opportunities for non-traditional learning.
- Fund summer research fellowships.
- Establish pathways (articulation agreements, co-op programs, joint research projects, etc.) from four-year public and independent comprehensive colleges and universities to research university graduate programs.
- Develop more intern programs for graduate students.

[See also Goal One, Objective 5.]

Recommendation 2.21. Ensure that faculty entrepreneurial activities and industry-related research are recognized in the tenure and promotion process.

Recommendation 2.22. Build upon the SC Centers of Economic Excellence (CoEE) Program to stimulate research and innovation.

- Establish a fund to assist with faculty start-up and retention packages.
- Sustain the CoEE Program with full funding.
- Consider ways to expedite recruitment without waiting for endowments to "yield" funds.
- Consider suggestions from the Washington Advisory Group, CoEE's external program evaluator, to enhance the program.
- Use existing "stars" in both recruiting and retaining endowed chairs and other faculty and students.
- Consider changing the scope of the CoEE Program to include institutional research grants and the funding of programs or individuals currently in the state.
- Consider expanding the CoEE Program beyond funding for an individual and that individual's program to the funding of programs and initiatives (e.g., equipment and resources).
- Make a state investment in high risk/high impact science such as the California investment in stem cell research.[50]

"The Review Panel applauds the state of South Carolina for its vision in developing and implementing the CoEE Program. As the U.S. moves into what the writer Thomas Friedman calls a 'flat world,' where knowledge is the principal currency, a state cannot make a better investment than in its research institutions. South Carolina has constructed a program that focuses state resources on strategic goals, exploits natural advantages, and leverages private funds.... In the long term, the Centers of Economic Excellence Program, if sustained and complemented with other investments in education, should strengthen the perception of South Carolina as a place with an active role in the knowledge economy. This, in turn, will attract educated people to the state—including in areas not directly connected with the Research Centers—and also encourage more, and especially more of the best, graduates to stay."

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47 Federally Funded Research and Development Centers (FFRDCs) conduct research for the United States Government. For example, the Industry/University Cooperative Research Centers (I/UCRC) Program develops long-term partnerships among industry, academe, and government. The centers are catalyzed by a small investment from the National Science Foundation (NSF) and are primarily supported by industry center members, with NSF taking a supporting role in their development and evolution. Each center is established to conduct research that is of interest to both the industry and the center. An I/UCRC contributes to the nation's research infrastructure base and engineering and science workforce.

48 For example, the University of Buffalo School of Medicine and Biomedical Sciences offers $21,000 per year for doctoral students and an opportunity to apply for the Presidential Fellowship program of $25,000 for candidates from underrepresented groups who have outstanding academic credentials. Similarly, the University of Texas-Southwestern Medical Center at Dallas offers $22,000 stipends plus tuition, student services, and insurance per year for graduate students. (The average for completion of the Ph.D. at University of Texas-Southwestern Medical Center is five-and-one-half years.)
"Website Links to Member Graduate & Professional Schools" Webpage, Ventures Scholars Program Website (2006). www.venturescholar.org/hs/gradintro.html.

49 A proposal currently advanced by CHE envisions funding 20 stipends per year for a total cost of $200,000 per year, and students could hold them for a maximum of four years. See Recommendation 1.45.
Walters, Garrison. "South Carolina Commission on Higher Education Graduate/Professional Initiative" (2008), 3.

50 Passed by California voters in 2004, the California Stem Cell Research and Cures Bond Act authorizes "an average of $295 million per year in bonds over a 10-year period to fund stem cell research and dedicated facilities for scientists at California's universities and other advanced medical research facilities throughout the state." The Act was proposed to maximize "the use of research funds by giving priority to stem cell research that has the greatest potential for therapies and cures, specifically focused on pluripotent stem cell and progenitor cell research among other vital research opportunities that cannot, or are unlikely to, receive timely or sufficient federal funding, unencumbered by limitations that would impede the research." Text of Proposed Laws – Proposition 71. [Accessed October 7, 2008.] www.cirm.ca.gov/pdf/prop71.pdf.
To read the California Stem Cell Research and Cures Bond Act of 2004, see the California Codes Health and Safety Code Section 125291.10-125291.85.
For more information about the research funded by this Act, see www.universityofcalifornia.edu/news/stemcell_factsheet07.pdf .

Recommendation 2.23. Enact a statutory change to authorize tuition relief for faculty dependents and tuition reciprocity with peer institutions in order to increase competitiveness in recruiting and retaining faculty. [51]

As a recruitment tool to attract faculty, colleges and universities will benefit from the ability to offer tuition waivers to dependents of faculty. In addition, the ability to make arrangements with peer institutions relating to tuition reciprocity may also aid colleges and universities in their faculty recruiting efforts. Presently, state colleges and universities may provide waivers of tuition for permanent faculty and staff for no more than four credit hours a semester.[52] Additionally, full time faculty and administrative employees of South Carolina state-supported colleges and universities and their dependents are eligible to pay in state tuition and fees.[53] While there are a number of other provisions in state code relating to tuition waivers and tuition reciprocity for certain individuals, no other tuition waiver or reciprocity provisions expressly apply to faculty and their dependents. The General Assembly should consider amending existing provisions to add language that would afford state colleges and universities the ability to use tuition relief for faculty and their dependents as a mechanism for attracting quality faculty to their institutions.

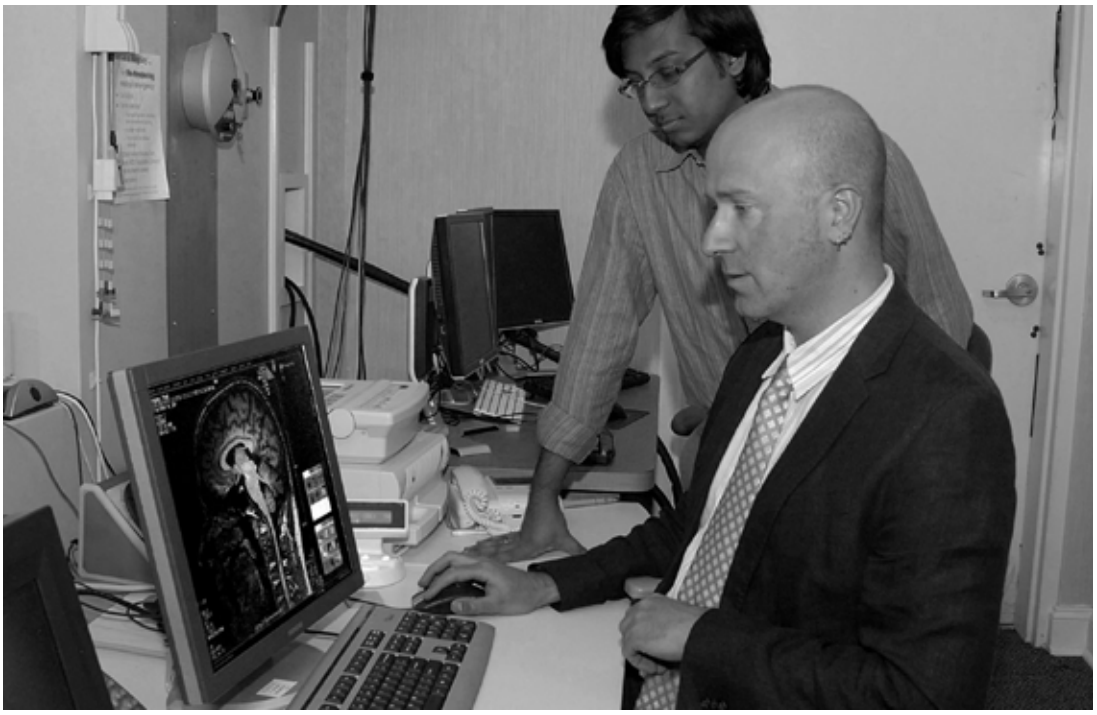
[See also Recommendation 2.2.]

"Investing in people on the leading edge of knowledge is by far the best economic development strategy a state can have."
2006-2007 CoEE Program Onsite Review Panel

Recommendation 2.24. Improve faculty pay and compensation.

Because recruiting and retaining faculty involves competing successfully in the marketplace for scare human resources, it is imperative that faculty pay and compensation meet or exceed national norms. Faculty pay at U.S. colleges and universities varies considerably by discipline and by type of institution. The average college professor makes $50,000 less than the average person with a professional graduate degree not employed as a college professor ($123,141).[54] Cary Nelson, president of the American Association of University Professors, says people may hear of a few very high salaries for faculty, but "there aren't so many of those well-off professors as people think."[55] The 2007-08 Report on the Economic Status of the Profession by the American Association of University Professors states the increase in overall average faculty salaries lagged inflation for the third time in the last four years, so that faculty salaries once again represent stagnant purchasing power.[56] South Carolina must increase faculty pay in order to recruit the best and brightest minds because realizing the value of people, or human capital, is a necessary component of competitive advantage.[57] The following table shows how South Carolina faculty pay compares to neighboring states in the South Atlantic region.

[See also Recommendation 3.4.]



CoEE Chair in Brain Imaging at MUSC Dr. Paul Simon Morgan (front) and Koushik Govindarajan, bioengineer for the MUSC Center for Advanced Imaging Research, study a brain scan while conducting research. Prior to accepting his CoEE post at MUSC, Dr. Morgan worked with Peter Mansfield, Nobel laureate for his work in MRI (Magnetic Resonance Imaging).

51 For example, dependents of full-time Furman University Faculty receive tuition scholarships if attending Furman University. See www.furman.edu/policies/view.htm?policy=488&name=228.1+Tuition+Benefits+for+Faculty+and+Staff&arc for full policy.
In addition, Minnesota State Colleges and Universities offer multiple plans for employees in regards to tuition waiver benefits for dependents. See pages 1-4 of www.hr.mnscu.edu/matrix/tuitionWaiver.pdf .
The University of Kentucky provides a 50% discount on tuition for eligible family members of full-time regular employees. See www.uky.edu/HR/benefits/fep_overview.html .

52 SC Code of Laws, as amended, Section 59-111-15.

53 SC Code of Laws, as amended, Section 59-112-60 and SC Code of Regulation 62.609(A)(2).

54 Wilson, Robin. "College Too Pricey? Don't Blame Faculty Pay," *The Chronicle of Higher Education.* (Nov. 7, 2008), A1.

55 "College Too Pricey? Don't Blame Faculty Pay," A1.

56 *2007-08 Report on the Economic Status of the Profession.* American Association of University Professors.
www.aaup.org/AAUP/comm/rep/Z/ecstatreport2007-08/survey2007-08.htm.

57 Friedman, Brian, James Hatch, and David M. Walker. *Delivering on the Promise: How to Attract, Manage, and Retain Human Capital* (New York: Free Press, 2007), vii.

Average Salaries of Full-Time Teaching Faculty, 2007-08
Nine-Month Contract Basis

	South Atlantic* Average	South Carolina Average	South Carolina Range
Research Institutions			
CATEGORY I (Doctoral)[1]			
Professor	$118,060	$108,818	$38,000 - $278,000
Associate	$80,669	$79,189	$20,000 - $195,000
Assistant	$68,348	$ 70,073	$30,000 - $172,000
Instructor	$48,039	$45,460	$24,000 - $101,000
Comprehensive Teaching Institutions			
CATEGORY IIA (Master's)[2]			
Professor	$84,844	$75,345	$35,000 - $129,000
Associate	$67,183	$63,767	$29,000 - $106,000
Assistant	$56,407	$54,360	$23,000 - $124,000
Instructor	$43,397	$43,968	$32,000 - $145,000
Comprehensive Teaching Institutions			
CATEGORY IIB (Baccalaureate)[3]			
Professor	$78,086	$71,777	$37,000 - $95,000
Associate	$62,590	$59,506	$36,000 - $95,000
Assistant	$52,396	$50,986	$29,000 - $80,000
Instructor	$41,521	$44,448	$29,000 - $95,000
Two-Year Regional Campuses			
CATEGORY III (Two-Year Colleges with Ranks)[4]			
Professor	$77,240	$65,539	$59,000 - $76,000
Associate	$61,669	$49,175	$34,000 - $77,000
Assistant	$53,501	$31,438	$40,000 - $72,000
Instructor	$43,426	$28,147	$25,000 - $54,000
Technical CollegesCATEGORY IV (Two-Year Colleges without Ranks)[5]			
No Rank	$ 47,295	$46,016	$22,000 - $78,000

[1] Clemson, USC-Columbia, Medical University of South Carolina
[2] Citadel, Coastal Carolina, College of Charleston, Francis Marion, South Carolina State, Winthrop
[3] Lander, USC-Aiken, USC-Beaufort, USC-Upstate
[4] USC-Lancaster, USC-Salkehatchie, USC-Sumter, USC-Union
[5] Technical Colleges

**AAUP average salary by Region; "Where are the Priorities: The Annual Report on the Economic Status of the Profession, 2007-08." American Association of University Professors. March 2008, 24.*

Goal Three

Make South Carolina a Leader in Workforce Training and Educational Services

Overview

The availability of a highly skilled workforce is the key to economic prosperity for any city, state, region or nation. South Carolina's competitive advantage largely rests on the state's ability to maximize the educational potential of its citizens. The benefits of higher education including higher salaries, more stable employment, and increased tax revenues can be maximized by connecting education and training to the existing and developing economy. As noted in the *2007 South Carolina Labor Market and Economic Analysis Report,* the labor force participation rate (the percentage of the population in the labor force) has been consistently lower in South Carolina than in the United States over the past several years. In 2007, South Carolina's labor force participation was 63.8% compared to 66% with the deficit found primarily in the older population due to retiring workers.[1] However, given the state's current economic crisis, labor force participation has decreased this year as South Carolina's unemployment rate increases. Such data support the need for an emphasis on increased education and training for adults while South Carolina prepares a workforce sufficient both for replacing retiring workers and providing a workforce for growing fields.

South Carolina needs to prepare the workforce needed for the sectors expected to grow between 2006 and 2016. As shown in the following chart , the education and health services sector has been South Carolina's fastest growing sector, increasing employment by 40%, or more than 57,000 jobs, in the past 10 years. Similarly, more than 45,000 jobs were added in professional and business services, and more than 39,000 in leisure and hospitality. Manufacturing, however, has lost over 91,000, or 27%, of its jobs from 1998 to 2007.[2]

In order to adapt to the employment changes in South Carolina, the state must ensure that it produces a highly trained, skilled workforce for those sectors which are experiencing dramatic growth. Given the current economic crisis, it is imperative that the state have an action plan to prepare workers for industries which can recover more quickly from economic downturns. The Action Plan also provides a template for the state to change its economic direction in order to capitalize on the growth of the knowledge economy.

In 2007, the state had its highest rate of growth in non-farm jobs since 2001.[3] However, such growth will continue only if a suitable workforce is present and available in the state. Therefore, a balance must be achieved among professionals, technicians, and trade persons to support all levels of industry growth in South Carolina. Convenient, economical, and timely access to further training and education is essential to enable workers to adjust to the rapid changes characteristic of the modern economy.

South Carolina Employment Change by Industry, 1998-2007

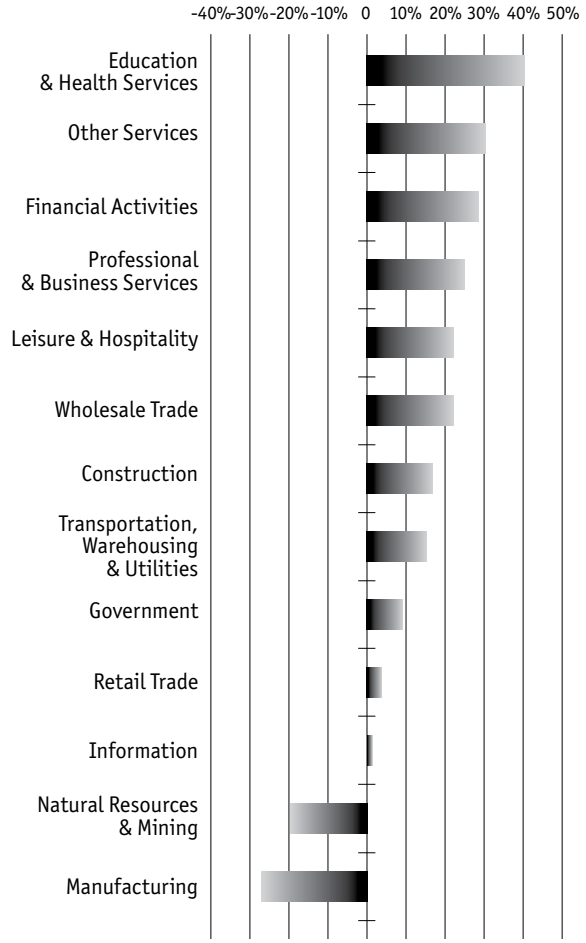


Figure 3.1. Percentage of Employment Change by Industry in South Carolina, 1998-2007.[4]

Building on the Success of Existing Programs

1 *2007 South Carolina Labor Market and Economic Analysis Report*. South Carolina Department of Commerce (June 2008), 17-18. www.sccommerce.com/docdirectory/ResearchFolder/Labor%20Market%20and%20Economic%20Analysis%20Report%20-%20South%20Carolina%202007.pdf.

2 *2007 South Carolina Labor Market and Economic Analysis Report*, 20.

3 *2007 South Carolina Labor Market and Economic Analysis Report*, 19.

4 *2007 South Carolina Labor Market and Economic Analysis Report*, 20.

South Carolina also has a long tradition of meeting the needs of new and expanding businesses by providing workforce development training to support their growth. Since its inception in 1961, the Center for Accelerated Technology Training (CATT), a division of the South Carolina Technical College System, and its readySC program have been training employees for new and expanding industries. Participants in the readySC program are trained to meet the specific requirements of qualified industries. In 2006-2007, readySC served 90 companies and trained nearly 7,000 individuals.[5] This program is clearly one of South Carolina's competitive advantages.

Another initiative designed to meet business needs is Apprenticeship Carolina, which supports the creation of business-sponsored registered apprenticeship programs. Registered apprenticeships have not been extensively utilized in South Carolina. However, since 2007, Apprenticeship Carolina staff have worked with technical colleges and businesses to provide information and technical assistance to create registered apprenticeships.[6]

Through its work with employment clusters and the efforts of the Workforce and Education Task Force, New Carolina is a key catalyst for collaboration and for bringing together educational providers and a wide variety of stakeholders, including industry. As defined by New Carolina, a cluster is a group of complementary businesses that focuses on or services the same industry. New Carolina's clusters are intended to increase South Carolina's competiveness by bringing businesses together "to increase efficiency and innovation within that industry, while boosting the overall economy in their region by attracting more businesses to the area and enhancing existing business."[7] Some of the benefits of New Carolina's clusters are shown in the Figure 3.2.

Overall, these clusters add value to South Carolina by raising the profile of a region's assets, attracting new businesses, creating high wage jobs, and retaining competitive, creative, and talented individuals.[9]

Outline of Section Recommendations

Although South Carolina has several workforce training programs available, greater levels of education and workforce training are needed in order to be competitive. In addition to the recommendations included in Goal One, Objective Four, regarding increasing adult participation in higher education, workforce development training for business is an area where the state has had great success and can do more. The recommendations included in Goal Three will help South Carolina provide the workforce training and services needed to prepare adults for employment in sectors expected to grow between 2006 and 2016. This workforce training is needed to compete in the knowledge economy where the businesses and industries which depend on and are created by research, innovation, and escalating advances in technology increasingly choose locations based on the workforce, not on the presence of physical and natural resources or even on tax structures.

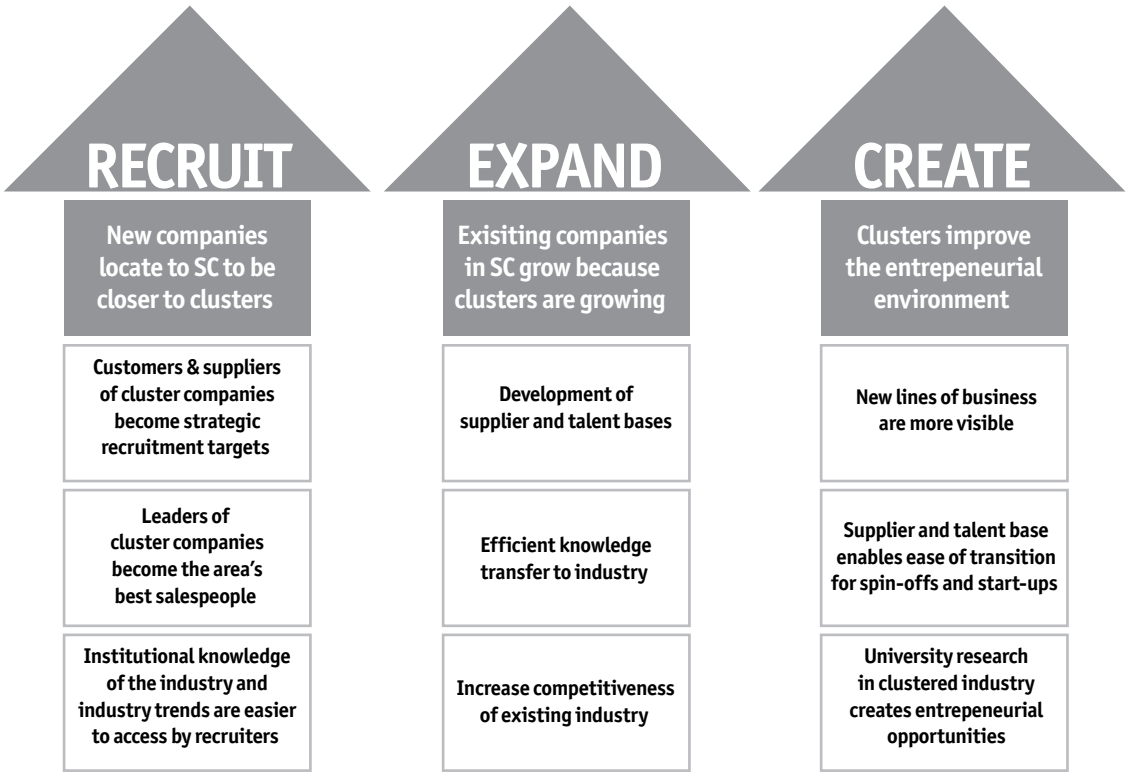


Figure 3.2. Demonstration of the Value Added By New Carolina's Clusters to South Carolina's Economic Development

5 *2006-2007 Fiscal Year Annual Report*. Center for Accelerated Technology Training (2007), 3. www.readysc.org/AnnualReport_FY2007.pdf.

6 "Apprenticeship Carolina" Webpage, South Carolina Technical College System Website [Accessed December 8, 2008]. www.sctechsystem.com/ApprenticeshipCarolina/default.htm.

7 Annual Report, New Carolina (October 2007), 7. www.newcarolina.org/images/PDF/SCCCAR1107.pdf?phpMyAdmin=xlKXhyicfrluHrFHjWX5OfuTVC0.

8 *Annual Report*, 18

9 *Annual Report*, 19.

Specific actions that can ensure economic vitality and raise the quality of life for all of the state's citizens through career attainment are essential. Accordingly, this report identifies the following objectives needed to accomplish the goal of making South Carolina a leader in workforce training and educational services:

- Prepare the Workforce for Economic Development Cluster Needs
- Communicate the Importance and Value of Higher Education and the Action Plan to Targeted Groups
- Connect Adults to Education and Training Opportunities
- Identify or Create Financial Pathways to Attain Education and Training Goals
- Strengthen Higher Education Services to Enhance Workforce Development
- Strengthen the Foundations for a World-class Scientific and Technical Workforce

The recommendations tied to each of these objectives are necessary to ensure the state's higher education environment is robust and progressive and one that produces a highly skilled, trained workforce that will meet the needs of the state's changing economy.

Objectives and Recommendations to Achieve Goal Three

Objective 1: Prepare the State's Workforce for Economic Development Cluster Needs

Recommendation 3.1. Align higher education programs to support statewide and regional clusters.

For example, there are nine statewide clusters currently identified by New Carolina: Agribusiness/Forestry, Apparel, Automotive, Distribution Services, Engineering, Nuclear, Recycling, Textiles, and Tourism.[10] The regional clusters are:

- Lowcountry: Advanced Security, Aerospace, Automotive, Biosciences, and Creative Industries
- Midlands: Hydrogen, Fuel Cells and Nuclear, Insurance and Technology, Advanced Manufacturing, Health Care, and Transportation and Logistics
- Upstate: Aviation, Composites, and Medical Devices

Recommendation 3.2. Develop or expand higher education programs to support cluster growth, especially in workforce shortage areas.

Workforce shortages[11] exist in the following areas:

- **Advanced Manufacturing and Technologies**
  - New Carolina Clusters: aerospace, advanced security, apparel, automotive, composites, engineering, hydrogen and fuel cells, medical devices, recycling, and textiles
    - Mechatronics[12] Technicians
    - Engineering Technicians
    - Industrial Maintenance Technicians
- **Energy**
  - New Carolina Clusters: agribusiness, engineering, hydrogen and fuel cells, nuclear, and recycling
    - Skilled crafts
      - Pipe-welder
      - Industrial Electrician
      - Industrial Ironworker
      - Industrial Maintenance-Mechanical
      - Industrial Millwright
      - Industrial Pipefitter
      - Instrumentation Technician
    - Radiation Protection, Electrical, Mechanical, Chemistry
    - Instrumentation and Control Technicians
    - Non-Licensed Operators
    - Line-workers
    - Engineers
    - Heating, Ventilation, and Air Conditioner Technicians
- **Health Care Occupations**
  - New Carolina Clusters: biosciences, insurance technology, medical devices
    - Healthcare technicians and professionals
      - Nurses
      - Radiation Technicians
    - Nursing and other allied health faculty
- **Tourism and Creative Industries**
  - New Carolina Clusters: creative industries, tourism
    - Graphic Arts
    - Culinary Arts: Kitchen Managers, Executive Chefs and Sous-Chefs, Baking and Pastry Chefs, Line Cooks
    - Marketing, Sales and Service: sales and marketing managers for restaurants, hotels and attractions
  - Hospitality and Tourism: hotel general managers, food and beverage managers, Catering Directors, Hotel Division managers
- **Transportation and Logistics**
  - New Carolina Clusters: automotive, aviation, distribution services
    - Commercial Truck Driver
    - Diesel Mechanic

Education areas experiencing critical shortages have also been included, as K-12 teachers provide the foundation for all occupations. The existence or prediction of shortages in these occupational areas is based on industry and industry association dialogue, as well as on state publications:

10 "Statewide and regional Clusters" Webpage, New Carolina Website [Accessed December 1, 2008.] Also known as South Carolina's Council on Competitiveness, New Carolina is a non-profit, public-private partnership working to increase South Carolina's economic competitiveness through a cluster development strategy, where similar companies come together to increase efficiency and innovation within that industry, while boosting the overall economy in their region. A cluster is a group of businesses in a certain region that focus on or service the same industry (e.g., Silicon Valley for computers, Napa Valley for wine and Detroit for automotive). www.newcarolina.org/index.php?option=com_content&task=view&id=29&Itemid=35.

11 These workforce shortages are identified by the South Carolina Technical College System's *Adult Pathways* critical workforce clusters. For more information about *Adults Pathways*, see Recommendation 3.11.

12 Mechanical and Electronics Engineering (mechatronics) is the combination of mechanical engineering, electronic engineering and computer engineering. The purpose of this interdisciplinary engineering field is the study of automata from an engineering perspective and serves the purposes of controlling advanced hybrid systems.

- **Education** (PACE Approved Subjects 2007-2008[13])
  - Agriculture, art, business education, dance, emotionally disabled*, English (secondary), family and consumer sciences, foreign languages (Spanish, French, German, Latin), health*, history* (secondary), industrial technology, mathematics (secondary), media specialist (library science), middle level areas (language arts, mathematics, science, social studies), music, physical education, secondary science (biology, chemistry, physics), social studies* (secondary), and theatre

Recommendation 3.3. Fund a bond bill to support necessary infrastructure and facilities renovation, maintenance and expansion.

Program expansion and development often incur additional costs for an institution. Programs that require extensive equipment purchase for the dedication of lab space, and programmatic accreditation are particularly costly.

[See also Recommendations 1.21, 2.18, and 4.2.]

Recommendation 3.4. Develop sources of funding to hire additional and replacement faculty, especially in fields that produce graduates for occupations in key clusters and critical areas.

As faculty retire and programs expand, it will be essential to have a mechanism to replace and hire additional faculty in such fields.

[See also Recommendation 2.24.]

In December 2008, CHE calculated the accumulated maintenance needs of South Carolina's public institutions of higher education at more than $797 million.

Recommendation 3.5. Improve student recruitment into high demand occupations which support targeted clusters.

Colleges have difficulty recruiting students into programs that support some high demand fields such as industrial and engineering technology. Efforts to increase student awareness of these occupations are essential. Employers must be encouraged to promote careers in their industry by engaging vigorously with higher education, K-12, and adult workforce service agencies. Regional Education Centers provide the comprehensive framework to connect students and adult workers to education and jobs with South Carolina companies. Tools created by Personal Pathways to Success can be used to introduce students to a variety of occupations in areas of high demand in the state and region.

Recommendation 3.6. Identify and implement ways for higher education and industry to communicate about workforce needs.

Key groups to be included in the communication and strategizing process are: existing state agencies (CHE, Department of Commerce and its Workforce Investment Board, etc.), SC Technical College System, higher education institutions, South Carolina Independent Colleges and Universities (SCICU), and New Carolina Clusters workgroups and committees/task forces, among others.

[See also Goal 2, Objective 3.]

Objective 2: Communicate the Importance and Value of Higher Education and the Action Plan to Targeted Groups

Recommendation 3.7. Implement an aggressive public relations and communications plan targeted to both the policymakers who would support and fund the Action Plan and the citizens who would benefit directly from the successful implementation of the Action Plan.

Critical audiences for Action Plan marketing materials include:

- Policymakers and programmatic champions;
- Business leaders and government leaders (Governor, legislators) for the purpose of obtaining support and resources for implementation;
- Higher education community (administrators, faculty, and staff) to ensure acceptance and enactment of key strategies;
- Collaborative partner agencies such as the SC Department of Commerce, Workforce Investment Act Boards, and the South Carolina Department of Education (SCDE) to obtain support for the implementation of key strategies; and
- K-12 leadership, counselors, and administrators, faculty, and staff to ensure the development and maintenance of a seamless transition between K-12 and higher education within the strategies implemented in the action plan

In addition, it is necessary that the following audiences be targeted to explain and emphasize the importance of higher education for employment and quality of life:

- Parents and students;
- Adults, specifically those unemployed, underemployed, or in occupations becoming obsolete; and
- Underserved populations who do not see education as transformational.

Messages to be communicated to policymakers and the general population include:

- South Carolina must leverage its educational resources to be competitive in the global marketplace, and must fund its colleges accordingly;
- South Carolina citizens without postsecondary education will have difficulty finding jobs to support a family;
- Higher education is extremely important to wages and to quality of life for all citizens;
- The specific careers that are and will be in high demand in South Carolina and/or in specific regions of the state; and
- How to access education and training in these occupations, listing available resources.

13 "Critical Subjects and Districts" Webpage, SC Department of Education Website [Accessed December 1, 2008.] www.scteachers.org/cert/pace/subdist.cfm. Subjects identified in the list above with an asterisk are not listed as Critical Needs subjects for the South Carolina Teachers Loan Program. In addition, Speech Language Therapist and Early Childhood Education are considered Critical Needs subjects for the SC Teachers Loan Program, but are not part of the PACE program.

Recommendation 3.8. Develop a compelling united message from all institutions of higher education to the targeted stakeholders to ensure broad understanding of the critical relationship between education and the state's economic future.

A taskforce comprised of communications professionals representing all institutions of higher education and the SC Arts Commission would be formed to:

- Collect media outreach materials from the state's universities, technical colleges, and the national for-profit colleges as well as examples of services supporting various programs and recruitment strategies for underserved populations including minorities, the under-employed and adult learners;
- Collect and review existing career awareness and information materials; and
- Develop a comprehensive information campaign and budget.

[See also Recommendation 1.6.]

Objective 3: Connect Adults to Education and Training Opportunities

Recommendation 3.9. Develop a coordinated initiative between the state's technical colleges and local school district adult education programs to provide opportunities for adults seeking to obtain a General Education Development (GED®) diploma.

This recommendation, developed in collaboration with the SCDE's Office of Adult Education and the South Carolina Technical College System, is not designed to supplant the extensive and successful efforts of existing adult education programs in South Carolina. Rather, its intent is to provide an additional avenue for adults not currently participating in GED programs. In addition, adults who earn their GED diploma at a technical college will gain exposure to the college environment and programs, including workforce training programs, and that exposure may make continued education more likely.

Recommendation 3.10. Implement fully the certificate system as proposed in the "New Front Door" CHE white paper[14] for adults seeking to gain higher level employment skills.

This system creates a flexible, non-threatening, and relevant approach for adults to follow that allows them to succeed.

[See also Recommendation 1.35.]

Recommendation 3.11. Implement fully the South Carolina Technical College System's *Adult Pathways* initiative.

This effort helps ensure that business and industry in identified critical clusters have access to a reliable, productive workforce. *Adult Pathways* identifies South Carolina's five critical workforce clusters (Advanced Manufacturing and Technologies, Energy, Health Care, Tourism and Creative Industries, and Transportation and Logistics) and brings together existing and new workforce development initiatives to ensure that businesses have the employees they need and individuals have opportunities for employment in the knowledge economy. Initiatives already established or currently being implemented include: curriculum and continuing education programs offered at the 16 technical colleges; Center for Accelerated Technology Training (CATT) and its readySC program; Lottery Tuition Assistance; WorkKeys; the Allied Health Initiative; Apprenticeship Carolina; and Achieving the Dream. New initiatives include competeSC and Enterprise Campus (statewide). Future plans include Statewide Cluster and Commercialization Initiatives.

Recommendation 3.12. Implement fully both components of the South Carolina Technical College System's *compete SC* initiative: QuickJobs Carolina[15] and Retool Carolina.[16]

These two targeted accelerated job readiness programs will assist adults in gaining new skills to participate effectively in the 21st century work environment. With QuickJobs Carolina, a strategy created at Greenville Technical College and enacted in other locations, technical colleges will pinpoint and address significant local job shortages in key industry areas, while collaborating with local Regional Education Centers (RECs) and area businesses. Retool Carolina will provide targeted, customized training to incumbent workers of companies that may not be ready to expand, but the need for retraining employees is vital to maintaining competitiveness.

Recommendation 3.13. Support the timely implementation of the *Kuder Journey* system.

Through web-based technology, this system will allow adults to access needed assistance and services as they seek ways to enhance their workforce skills.

Recommendation 3.14. Develop and implement a comprehensive statewide education plan to facilitate the reentry into society and the workforce of those who have been incarcerated.

A comprehensive plan will be developed and implemented. This plan will include education, workforce skills training, and enhanced workplace placement.

Recommendation 3.15. Support the statewide implementation of the Department of Commerce's WorkReadySC, including the WorkKeys credentialing program.

As a collaboration among public educational institutions and SC businesses, WorkReadySC uses WorkKeys to create a common "skills" language to facilitate communication and interaction between the partners. Partners across the state include the 16 technical colleges, the 12 local Workforce Investment Act areas, providers of adult education, and businesses. Developed by the non-profit group American College Testing (ACT), the WorkKeys system is employed in South Carolina to analyze specific job requirements, specific employee skills and develop training solutions to help workers meet the skill requirements of their jobs. Through this program, adults will be able to obtain a nationally recognized certificate that provides potential employers proof of their work readiness.

14 See Appendix III.

15 QuickJobs is a continuing education program offered at technical colleges where the college works with area businesses to identify critical employment needs and develops streamlined programs for students to train and move into the workforce quickly.

16 Retool Carolina is a collaboration between the SC Technical College System and the SC Chamber of Commerce where existing businesses and local technical colleges work in partnership to provide specialized existing worker training for eligible businesses.

Recommendation 3.16. Determine whether the state's higher education institutions have the necessary capacity to satisfy the expanding need for adult career counselors.

A survey should be conducted of available programs and associated student participation. Survey findings, as well as other anticipated future needs, should be distributed to all institutions of higher education with the request that they develop ways to close any gaps.

Objective 4: Identify or Create Financial Pathways to Attain Education and Training Goals

Recommendation 3.17. Conduct a comprehensive analysis of financial pathways and barriers.

As part of this analysis, compile a list of all state, federal, and private agencies that provide financial assistance for postsecondary education and training. This list should include agencies and initiatives such as:

- Two and Four-Year Institutions/College funds
- South Carolina – LIFE/HOPE/need-based grants/Lottery Tuition Assistance Program/ SC Tuition Grant/Palmetto Fellows/Access and Equity funds
- CHE – Scholarships
- Workforce Investment Act (WIA)
- Department of Social Services
- Vocational Rehabilitation
- Military Benefits
- Student Loan Companies
- Americorp
- Federal funds (with Free Application for Federal Student Aid[17]): Pell,[18] Supplemental Educational Opportunity Grant (SEOG),[19] Academic Competitiveness Grant (ACG),[20] Teacher Education Assistance for College and Higher Education (TEACH),[21] Science and Mathematics Access to Retain Talent (SMART),[22] Stafford loans,[23] and Federal Work-Study Program[24]
- TRIO Program funds
- Employer supported tuition, especially registered apprenticeships
- Trade Assistance Act[25]

A 2007 study at Texas A&M University, *Financial Barriers to Higher Education,* identified a number of ways that finances and financial knowledge affect college attendance. Findings included:

- **Money plays a larger role in the decision to attend college for first-generation college-going populations than for non-first-generation college-going populations.**
- **Controlling for age, respondents who have financial aid knowledge in high school are 95% more likely to attend college than those without such knowledge.**

The study came to the conclusion that "colleges need to carry more of the responsibility of educating high school students and their families about the value and affordability of a college education."

Recommendation 3.18. Construct a model indicating categories of students entering postsecondary education and the types of training that they will need to meet the state's workforce demands.

Categories of students may include:

- Retirees desiring change of career
- Individuals with high school diploma needing to increase skills
- Individuals with high school diploma who have lost employment
- Others desiring career change
- Unemployed individuals choosing to seek employment due to a personal status change (after staying at home with a family, divorce, etc.)
- Student categories included at: http://nces.ed.gov/pubs2007/2007041.pdf
- *Kuder Journey* website student categories: www.palmettopathways.org/EEDA2/portal/k4a.aspx

In order to develop this model, a taskforce should be created to identify potential students and types and levels of training needed for workforce needs. The taskforce should include representatives from the Workforce Investment Act Boards, Vocational Rehabilitation, Student Loan Corporation, etc.

Recommendation 3.19. Enact legislation to close financial aid gaps in order to make relevant education and training available for all adults.

This action could include:

- Tuition reduction for target populations
- Additional grant/scholarship funds for target populations

17 The Free Application for Federal Student Aid (FAFSA) is a form that students must fill out annually to determine their eligibility for many state and federal financial aid programs.

18 The Federal Pell Grant Program provides need-based grants to low-income students to promote access to postsecondary education. Grant amounts are dependent on the student's expected family contribution, the cost of attendance, and other factors.

19 The Supplemental Educational Opportunity Grant (SEOG) program is for undergraduates with exceptional financial need. Pell Grant recipients with the lowest expected family contributions (EFCs) will be considered first for a federal SEOG. The federal SEOG does not have to be repaid.

20 The Academic Competitiveness Grant (ACG) provides up to $750 for the first year of undergraduate study and up to $1,300 for the second year of undergraduate study. The ACG award is in addition to the student's Pell Grant award.

21 The Teacher Education Assistance for College and Higher Education (TEACH) Federal Grant Program provides grants of up to $4,000 per year to students who intend to teach in a public or private elementary or secondary school that serves students from low-income families.

22 The National Science and Mathematics Access to Retain Talent (SMART) Grant provides up to $4,000 for each of the third and fourth years of undergraduate study. The National SMART Grant award is in addition to the student's Pell Grant award.

23 A Stafford Loan is a loan offered to eligible students as determined by the Free Application for Federal Student Aid. These loans may be subsidized by the U.S. Government or unsubsidized depending on the student's financial need.

24 The Federal Work-Study Program (FWS) is a need-based financial aid program in which eligible students work part-time on-campus while enrolled at a college. Students must complete the Free Application for Federal Student Aid (FAFSA) every year to apply for FWS.

25 The Trade Assistance Act provides re-employment services to workers who have lost jobs as a result of imports from overseas and shifts of production to other countries due to foreign competition. Eligible workers may also receive classroom and on-the-job-training, trade readjustment allowances, and relocation and job search payments.

- Higher Education Opportunity Act (HEOA) which allows an institution to determine if a student meets ATB[26] requirements with satisfactory completion of six credit hours (rather than obtaining certain scores on an ATB test)[27]
- HEOA excludes all veterans' benefits and national service education awards from estimated financial assistance calculations effective July 1, 2010.[28] This action will allow a student to qualify for more aid

[See also Recommendation 1.36.]

Objective 5: Strengthen Higher Education Services to Enhance Workforce Development

Higher education services promote and support the kind of learning students need to meet emerging challenges in the workplace, in a diverse democracy, and in an interconnected world. Services are broadly defined as those that promote access to and success in postsecondary education students through financial pathways, learning-centered teaching, and partnerships which broaden the academy.

Additionally, higher education services provide opportunities for education and enrichment to communities that enhance quality of life and provide amenities that can help to attract and retain a qualified workforce.

Public service activities serve undergraduate education needs through creative inquiry programs conducted by researchers, graduate needs through thesis-based research, and many citizen groups through focused research that improves the knowledge base that drives economic development. Economic development is supported through research funded on a wide variety of topics. Extension programs transfer new knowledge from the research programs to targeted groups through certificate programs, continuing education programs, workshops, and one-on-one assistance at the county level.

Graduate programs provide relevant work experience for Ph.D. and master's level students, medical residents, and postdoctoral fellows. Continuing education programs provide ongoing educational opportunities.

Arts and cultural offerings provided by many institutions of higher education offer programs and learning experiences that encourage interaction between institutions and their communities and help create communities where knowledge- and creativity-based workers choose to live and work.[29]

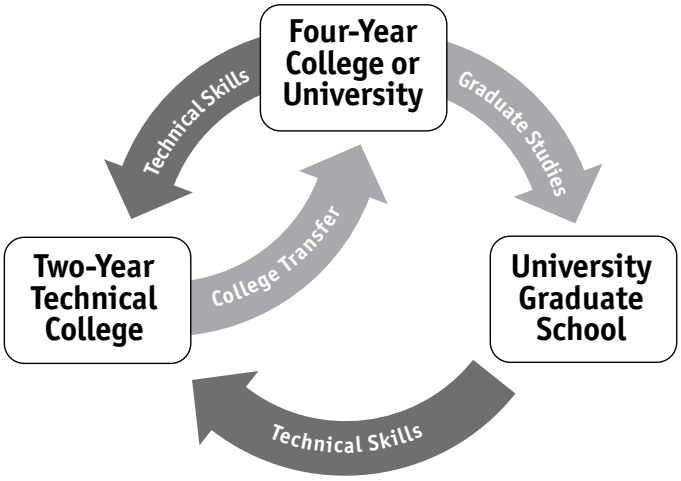
Recommendation 3.20. Encourage further use of best practices in learning-centered teaching including community and problem based research, service learning, interdisciplinary course models, study abroad integration, intensive writing, and creative inquiry.[30]

Recommendation 3.21. Increase opportunities for relevant work experience as part of instructional programs.

[See also Recommendation 1.35.]

Recommendation 3.22. Develop a reverse bridge pathway from four-year to two-year institutions to provide students enrolled in liberal arts programs and liberal arts graduates access to practical, technical and hands-on training in order to match their range of skills with workforce needs.

The concept should be presented to four-year college and graduate school students so they can acquire marketable technical and professional skills as a part of their education either prior to or following graduation. The following figure illustrates this concept.



Traditional higher education pathways are shown light grey, the Reverse Bridge is illustrated by the dark grey arrows.

Figure 3.3. Reverse Bridge Concept

[See also Recommendation 1.22 and Appendix IV.]

Recommendation 3.23. Develop a comprehensive listing of credit and non-credit academic programs, services, and resources of South Carolina higher education institutions that assist in addressing the diverse needs of a developing workforce.

Recommendation 3.24. Develop a central website which interested persons or employers may use to find higher education programs, providers, instructions, links to helpful sites and other information relevant to workforce needs.

The design of such a website should include a sophisticated set of analytical tools (such as Google Analytics) to enable robust site evaluation by deploying functions such as benchmarking, segmentation, historical analysis, etc. to allow for continuous improvement by understanding visitor behavior, providing access to desired information and services, and adapting the site to meet the needs of users.

[See also Recommendation 1.39.]

26 The Ability to Benefit (ATB) is a U.S. Department of Education-approved test for students who do not have a high school diploma or equivalent, such as a GED, who wish to receive federal financial assistance. Students without a high school diploma or GED must successfully pass the ATB examination to be considered for federal financial assistance.

27 "Higher Education Opportunity Act" (110-315, August 14, 2008). 110th Congress (2008). http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=110_cong_public_laws&docid=f:publ315.110.pdf . See Section 485 a4.

28 "Higher Education Opportunity Act" (110-315, August 14, 2008). 110th Congress (2008). http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=110_cong_public_laws&docid=f:publ315.110.pdf. See Section 422 a 1 II.

29 Florida, Richard, *The Rise of the Creative Class: And How It's Transforming Work, Leisure, Community and Everyday Life*, (Basic Books, 2002).

30 *Greater Expectations: National Panel Report A New Vision for Learning as a Nation goes to College*, American Association of Colleges and Universities (2002).

Recommendation 3.25. Create a branding/marketing plan for the purpose of attracting citizens and employers to the workforce and for communicating the direct and indirect value of these services to communities and a strong workforce.

Objective 6: Strengthen the Foundations for a World-class Scientific and Technical Workforce

Over the last decade, various studies have warned that America's competitiveness in the knowledge economy is in danger because too few of our young people pursue careers in science and technology.[31] There are many prescriptions for change, but to a considerable extent they fall into the category of doing what we do now, but doing more of it. This strategy has not been very successful to date. South Carolina could be a leader in pursuing innovative approaches that have the potential to make a real difference. [See also recommendations in the Goal One report that address important science/mathematics, transition and college-preparation issues.]

"The bedrock of America's competiveness is a well-educated and skilled workforce."

The President's American Competiveness Initiative, 2006

Supporting Actions in Process

The Education and Economic Development Act (EEDA)

Enhancements to Palmetto and LIFE Scholarships[32]

Recommendation 3.26. Develop an innovative and flexible mathematics curriculum that makes it easier for undergraduate students and entering adults to consider scientific and technical majors.

Mathematics is an enormous barrier to student entry into scientific and technical fields. National studies indicate that students who have not consistently pursued mathematics from the ninth grade on are very unlikely to succeed in baccalaureate-level science and engineering fields—the ability to enter Associate-level programs is diminished as well.[33] The thinning of the science/technology pipeline is not entirely the consequence of failure to pass courses—many students opt not to pursue majors because they believe they will not have a chance to acquire the needed mathematics in a reasonable time.

South Carolina faculty in mathematics should team with colleagues in science and technology areas to develop programs that enable students to acquire effectively and quickly the mathematical knowledge needed for science and technology programs. To be successful, such programs will likely need to be limited to essential skills and be organized in a modular and competency-based fashion.

[See also Recommendation 1.13.]

Recommendation 3.27. Increase the productivity of gateway science and mathematics courses.

Recent research suggests that many students are lost to science and mathematics majors because of the lack of support they encounter in the "gateway" (introductory) courses they take their freshman and sophomore years in college. A recent book, *Talking About Leaving: Why Undergraduates Leave the Sciences,* by Elaine Seymour and Nancy Hewitt of the University of Colorado (Boulder: Westview Press, 2000) provides interesting perspective. The authors interviewed hundreds of students with equivalent SAT scores and high school grades who were planning to major in science/ mathematics/ engineering fields and found that, despite the beliefs of faculty, those who dropped out of those majors were as qualified as those who remained.

While we do not have data that suggest South Carolina has a particular problem with retention of students from gateway courses into science and technology majors, it is in everyone's interest that as many qualified students as possible be successful in these fields. Accordingly, the colleges and universities should develop a statewide Science and Technology Gateway Course Initiative (SCGCI) to ensure that all institutions have access to and implement the best and most effective ideas and strategies.

[See also Recommendation 1.27.]

"The crisis stems from the gap between the nation's growing need for scientists, engineers, and other technically skilled workers, and its production of them. Closing it will require a national commitment to develop more of the talent of all our citizens, especially the under-represented majority — the women, minorities, and persons with disabilities who comprise a disproportionately small part of the nation's science, engineering, and technology workforce."

Shirley Jackson, President, Rensselaer Polytechnic Institute, in *The Quiet Crisis: Falling Short in Producing American Scientific and Technical Talent* , 2002

Recommendation 3.28. Increase the participation of underrepresented populations in science and technology fields.

If South Carolina is to expand its science and technology workforce, most of the new students will need to come from African-American and other underrepresented student populations. The technical colleges should make their engineering technology programs more appealing to minority students and women while at the same time articulating to the university baccalaureate programs.

Also, the State of South Carolina needs to strengthen its support to programs that recruit, support, and enhance the participation of minorities and women in the science and technology fields. One such program is the South Carolina Alliance for Minority Participation (SCAMP). The State of South Carolina has recognized and supported the Alliance for Minority Participation (AMP) as a key component of reform within the state's educational infrastructure. The SCAMP is a statewide consortium of universities and colleges, whose goal is to increase the quantity and quality of minority students in South Carolina receiving bachelor's degrees in Science, Mathematics, Engineering, and Engineering

31 See, for example, the following:
Cavanaugh, S., "States Heeding Calls To Strengthen STEM," *Education Week*, Vol. 27, March 27, 2008.
Olsen, K., "Let's Frame the Future: Building a Solid Science and Engineering Foundation for This Century," *The College Board Review*, No. 210, Winter/Spring 2007.

32 Scholarship Enhancements are awarded to eligible students majoring in approved mathematics and science programs beginning in their second/sophomore year based on their date of initial college enrollment (freshman are not eligible for Enhancement funds). LIFE and Palmetto Fellows Scholarship and Scholarship Enhancements funds must be used toward the cost-of-attendance at an eligible four-year institution in South Carolina.
See: www.che.sc.gov/StudentServices/LIFE/Directives/PolicyGuidelineforthePalmettoFellowsandLIFEScholarshipEnhancements.pdf.

33 Sadler, P.M. & R.H. Tai, "Transitions: The Two High-School Pillars Supporting College Science.," *Science*, July 27, 2007, 457-458. www.sciencemag.org/cgi/content/summary/317/5837/457.

"If all racial/ethnic groups had the same educational attainment and earnings as whites, total annual personal income in the state would be about $10 billion higher."

Measuring Up 2008
South Carolina State Report Card on Higher Education

Technology Fields. SCAMP consists of twelve South Carolina institutions including six Historically Black Colleges and Universities (HBCU's).

Although all colleges and universities share responsibility for increasing African-American participation, South Carolina State University, the state's only public four-year HBCU, should have a significant role. SC State should provide individual and collaborative leadership with other universities to extend offerings in the STEM areas (e.g., SC State, jointly with another institution, has the only undergraduate nuclear engineering program in the state). In addition, South Carolina State should provide state leadership and assist technical colleges in making their engineering technology programs more appealing to minority students while at the same time articulating to the university's baccalaureate programs.

Finally, bridge programs[34] should be expanded among two- and four-year institutions in order to enhance the recruitment of minority students into STEM disciplines at the baccalaureate level.

[See also Recommendations 2.14, 2.17, 2.19, and 2.20.]

Recommendation 3.29. Develop a statewide undergraduate minor in computational science.

The field of computational science uses computer-based mathematical models to analyze and solve scientific, social scientific and engineering problems. Also known as simulation and modeling, computational science is rapidly becoming a critical technique for business and industry, where sophisticated computer-based models sharply accelerate the design and production of new products and services. Unfortunately, only the largest companies can afford to fully implement this technology: small and medium-sized businesses have serious difficulty finding the personnel and often can't afford the required software. South Carolina could take a series of steps to become a leader in deploying computational science in all kinds of businesses:

- For personnel, computational science is a technique that augments other areas, and in consequence should primarily be considered as a minor. For example, a student could have a computational science minor with a major in biology. A collaborative, statewide minor developed by the public (and if interested also the independent) universities could offer qualities of scale not easily produced by a single university. Similarly, collaborative offerings, with significant portions online, could offer both a greater range of choice and lower unit cost.
- For personnel, colleges and universities could create "computational co-ops" that place students in business settings both to provide expertise and to serve as a communications medium so that faculty can ensure that programs are designed to meet business needs.
- For infrastructure, colleges and universities could work together with the SC Department of Commerce to provide small and medium businesses with "jump start" software/hardware/ technical assistance packages that help them evaluate their ability to mount a computational science program.

In many cases, college graduates seek advanced skills and education that do not require an entire degree program, but for which some type of certificate would be valuable to assure employers of the skills acquired. For example, teachers are often expected to pursue additional teaching endorsements (referred to as add-on certifications) during employment.

34 A bridge program is an agreement between a four-year institution and a two-year institution to provide a direct and well-defined path for a student to be admitted to the four-year institution while taking coursework at the two-year institution.

Resources for Higher Education in South Carolina

In order to support the recommendations in this report, it is critical that higher education in South Carolina receive increased support from the state. Without such support, the state will continue to trail its neighboring states in higher education funding, and the initiatives necessary to increase the educational and economical competitiveness of the state will falter. As it stands, South Carolina's level of support[1] per full-time equivalent student (FTE) based on FY 2007 State Higher Education Finance (SHEF) data[2] was $5,838 compared to a national average of $6,773. South Carolina ranks 38th nationally and 15th out of the 16 Southern Regional Education Board states. Such low levels of state support do not encourage the kind of innovation needed to advance the state's agenda for excellence.

State leaders often cite 17% as the level of state support provided for higher education; that is, 17% of the state's total budget for FY 2007-08 goes to higher education. However, even this low figure is inflated as it represents the total spending authorization for higher education compared to the spending authorization for all state agencies. For higher education, this percentage includes the authorization to spend revenue derived from several non-state sources including:

- revenue from tuition and fees (which includes scholarship and grant aid);
- institutionally-generated revenues, including benefactor support;
- revenue from auxiliary enterprises such as dormitories, cafeterias, and athletic programs; and
- revenue from federal grants, private grants, and contracts.

Spending authorization is not the same as appropriated funds. Rather, it is purely a case of permitting an institution to expend funds from various sources. In reality, if only funding to colleges and universities from recurring state sources is included, the percentage of state support in FY 2009 is 10.2% of the state's appropriated funding compared to 14.9% a decade ago. This change represents a significant decrease in support.

Understandably, policymakers count scholarship funds as support for higher education. The amount that South Carolina appropriates for scholarships is in fact both significant and important. These funds benefit individual citizens, typically parents, but do not support the ability of colleges and universities to provide a higher quality education. Scholarship and grant funds are a part of each institution's tuition and fees. To count these funds separately double counts them.

The operating budget is not the only component of state support to higher education that affects institutional ability to provide a quality education for South Carolinians. In addition, capital funding is a normal part of every college and university's operation. National data comparing South Carolina's capital funding to that of neighboring states demonstrate the disparity in the average educational appropriation plus the average capital support per FTE. Over the most recent ten-year period in combined operating and capital support, North Carolina's average per FTE is $9,192, Georgia's is $8,278, and South Carolina's trails far behind at $5,120. In other words, North Carolina's total funding is 80% higher and Georgia's is 62% higher than South Carolina's.

Higher education in South Carolina has both a resource allocation problem, with a steadily declining proportion of state resources devoted to higher education institutions, and a resource reporting problem, with questionable figures that hide the true extent of the decrease. Both problems must be resolved.

1 "Support" in this context traditionally includes only operating funds that are appropriated by the SC General Assembly for use by colleges and universities.

2 Source: SHEEO.org, State Higher Education Finance (SHEF). www.sheeo.org/finance/shef/shef_data.htm. (See SHEF Data 1997-2007 by State HECA Adjusted Dollars.)

Recommendation 4.1. Fund higher education at the SREB average or above.

General fund appropriations for institutions of higher education in FY 1997-98 were approximately $654 million and increased to just under $758 million in FY 2007-08, a 15.8% change over the ten-year period, compared to a 69.8% increase in K-12 education funding over the same time period. However, today, in light of the present economic situation, funding for higher education is currently approximately $577 million, which is less than it was a decade ago, while the current funding for K-12 education, approximately $2.1 billion, is comparable to the funding received in FY 2006-2007. There is no argument regarding the importance of providing funding for a quality foundational K-12 education; however, if South Carolina wants to see its economy flourish, it must also promote higher education through additional support from general fund appropriations. An under-supported higher education system will be severely hampered in its efforts to impact positively and improve the state's economy. The following chart demonstrates that higher education in South Carolina is underfunded in comparison to other SREB states.

Recommendation 4.2. Support routine and predictable capital funding of colleges and universities with a portion of funding directed at eliminating accumulated maintenance needs.

The last bond bill for higher education in South Carolina was approved in 2000. Absent subsequent bond funding, our colleges and universities have been at a distinct disadvantage when compared to institutions in Georgia, Kentucky, and North Carolina. An analysis of their capital program support clearly demonstrates the importance these states have placed on addressing the whole program of higher education.

[See Recommendation 1.21 and 3.3.]

Funding Methods in Neighboring States

Capital funding is a critical component of the investment in higher education. [See Goal Two Overview.] South Carolina's neighboring states use the following methods for providing physical resources:

- In Georgia, the Legislature provides two major sources of funding for the state's 34 public colleges and universities. While larger facilities are typically financed through the sale of bonds issued by the Georgia State Financing and Investment Commission, cash appropriations from the Georgia General Assembly are also a major source of funding for construction projects. Each year, the Georgia Board of Regents uses the top-ranked building requests from each institution to develop a priority list of new buildings to be included in the University System's budget request to the Governor. Institutional lists of major repair and renovation projects are used by the Georgia Office of Facilities in administering the annual appropriation.
- In Kentucky, the Legislature provides capital funding through three mechanisms: general fund appropriations; an information technology and equipment pool; and a capital renewal, replacement, and maintenance pool. The Kentucky Council on Postsecondary Education (CPE) is responsible for submitting a six-year capital plan in odd-numbered years to identify the facilities and facilities-related needs of the state's public institutions. The Kentucky CPE identifies funding priorities based on a process which uses a statewide capital projects evaluation model, a space needs model, institution project priorities, and a review by the Council's architect.
- In North Carolina, the University of North Carolina Board of Governors develops biennial capital budget priorities based on each institution's six-year capital plan. Additionally, the Reserve for Repairs and Renovations addresses current maintenance needs

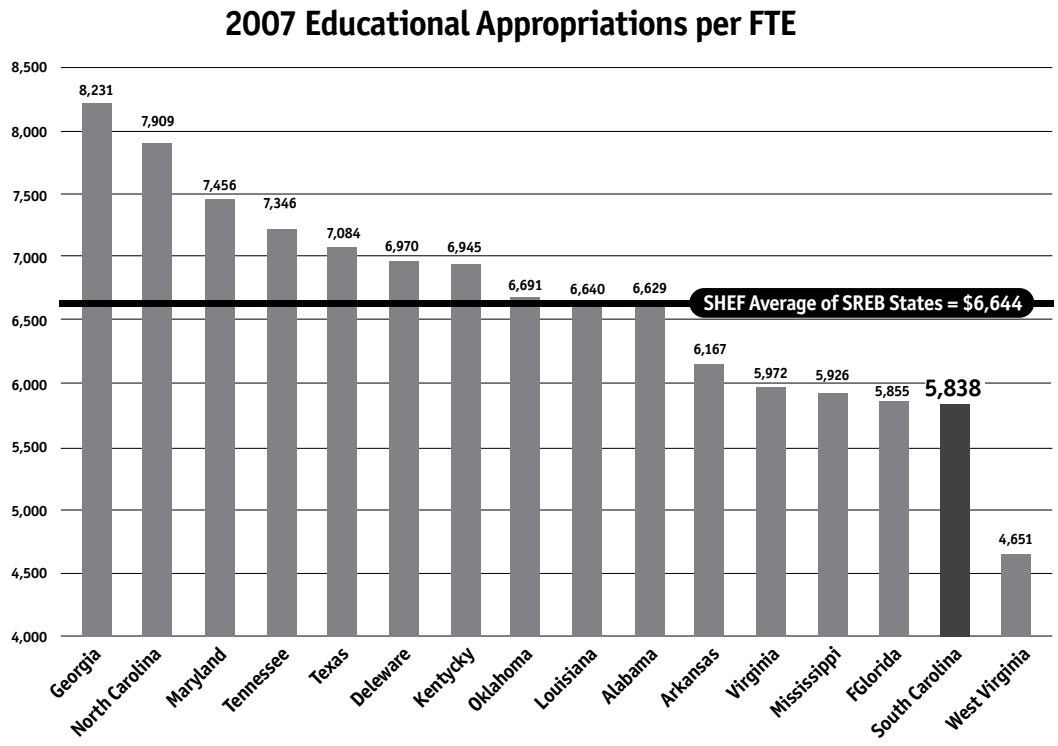


Figure 4.1. 2007 Educational Appropriations per FTE by SREB States.

Note: This calculation was derived by dividing educational appropriations by FTE.

and the documented backlog of deferred maintenance projects. This fund is an amount equivalent to 3% percent of the replacement value of state-supported buildings. The Reserve is currently allocated on the basis of 46% for UNC projects and 54% for other state agencies. In 2000, 73% of North Carolina voters authorized a landmark $3.1 billion bond bill in response to a legislatively-mandated study that identified a need for $6.9 billion for renovation and modernization, current capacity, future capacity, and other needs.

The chart below illustrates the ten-year average capital funding appropriated per student which includes all sources of funding.

When support for both capital and operating needs of colleges and universities is considered, the comparison changes dramatically. As the following table shows, South Carolina trails significantly.

Table 4.1. State Support for Operating and Capital Budgets

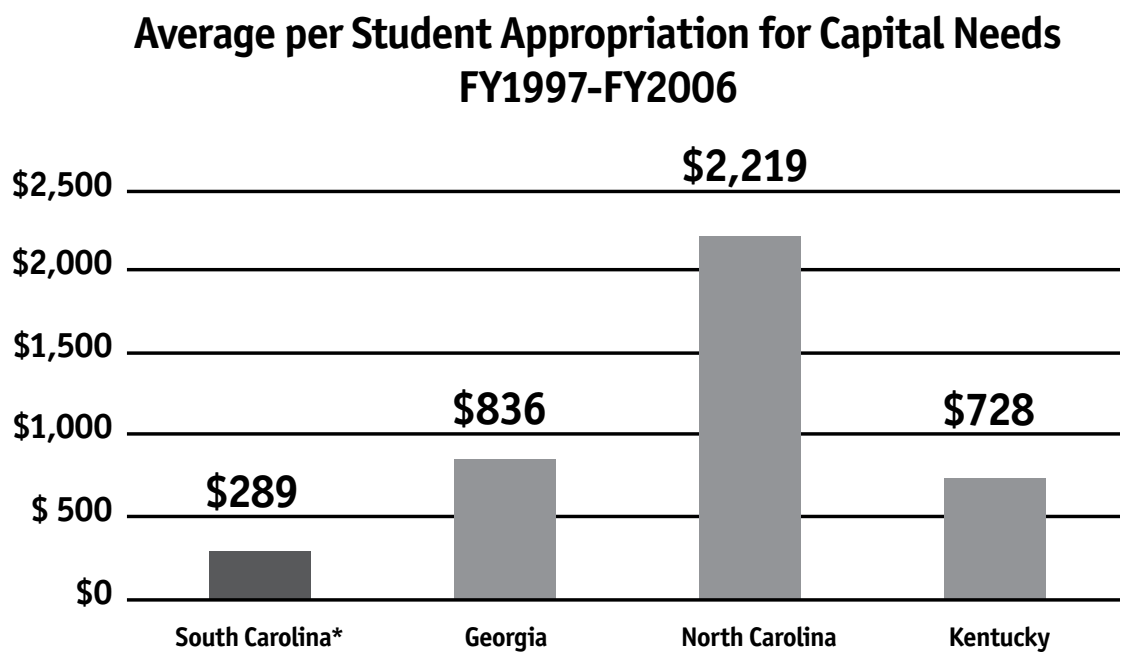
State	Average Educational Appropriation per FTE FY 1997-2006[3]	Average capital support last ten years	Total
North Carolina	$6,973	$2,219	$9,192
Georgia	$7,442	$836	$8,278
Kentucky	$6,293	$728	$7,021
South Carolina	$4,831	$289	$5,120

Recommendation 4.3. To maintain a more accurate picture of higher education funding, state data reporting should clearly distinguish between restricted funds (e.g., funding which is limited by donors or other external agencies to specific purposes, programs, departments, or schools) and unrestricted funding (e.g., funds, including those derived primarily from state appropriations for Educational and General [E&G] support and student tuition and fees, for which no stipulation has been made by the donor or other external agency as to the purpose for which the funds should be expended).

As an example of the confusion created by mingling these two distinct budget categories, the mandated budget reductions as of December 2008 reduced FY 2009 Education and General (unrestricted) support to South Carolina institutions by 22-28%. Unfortunately, in some descriptions of the cuts, restricted and unrestricted budgets were added together and followed with a statement that funding was reduced by only 4-6%. Such a description is erroneous because it suggests that all funds have the same flexibility, whereas in most cases institutions could not shift restricted monies to cover gaps left by unrestricted cuts.

Effective Management of Resources

Cost-benefit analysis long has been a standard process by which both private- and public-sector entities have evaluated the worth of initiating or continuing an activity, be it an adjustment in a product line or adding or deleting a step in a production process. In an era when appropriations of public dollars have become a comparatively small part of the overall



**** Sources include capital improvement bonds, capital reserve fund, and supplemental appropriations funding associated with the Life Sciences Act of 2004 is not included. These funds provided $220 million to S.C.'s three research institutions to support and expand economic development and $30 million to the remaining public colleges and universites. Including this funding brings S.C.'s number per student to $445 with is still significately below the level of support of neighboring states***

Figure 4.2. Average Student Appropriation for Capital Needs
Note: For South Carolina, capital funding includes capital improvement bonds, the capital reserve fund, and supplemental appropriations.

budget of most public colleges and universities, a number of South Carolina public institutions have been looking at the cost-benefit of having to deal with old-fashioned regulatory approaches that come with their status as public entities; they have found the costs high and the benefits lacking.

A problem hindering the performance of South Carolina colleges and universities involves the burdensome state regulatory process. In 2002, the Education Commission on the States documented a trend away from "centralized control and regulation" on the part of state government as it relates to higher education, with a shift to "strategic planning for dynamic markets models" and "more decentralized management."[3] Following this trend, South Carolina's institutional leadership has begun a conversation about ways to achieve accountability through effective management systems as opposed to multi-layered and often redundant regulatory processes that were created in a different era and continue simply because "it's always been done that way." During the past decade, various efforts have been undertaken to reform the complex array of statutes and provisos that add substantial cost and time to the most routine administrative tasks. While some success at reform has been realized, many of the more cumbersome processes remain.

The disproportionately heavy budget reductions imposed on public colleges and universities during the 2008-09 academic year have exacerbated the impact of this regulatory burden. With most institutions receiving substantially less than 20% of their budget from state appropriations, it is time to revisit the issue of regulatory relief. At present, the presidents and chancellors are involved in a collaborative effort to pursue selected reforms within the following four areas:

a) capital improvements and property management (financing and construction);

b) human resources management;

c) procurement; and

d) financial administration (management, investment, and tuition waiver flexibility).

The ultimate goal of this initiative is to provide our higher education institutions the latitude to operate as enterprise agencies, governed by decisions predicated upon managerial acumen and market imperatives.

The Higher Education Study Committee supports regulatory reform as a mechanism for further enhancing institutional effectiveness, efficiency, and innovativeness. With such regulatory reform and by emphasizing an approach anchored in individual institutional accountability and assessment through accepted audit procedures, the network of South Carolina's public institutions sees significant potential to gain enhanced flexible capacity to meet varied regional needs in a timely manner in 21st century terms, while also contributing to the overall achievement of the goals set forth within this overall strategic plan.

"PASCAL has been an enormous success…as I approach the end of my professional career, I cannot think of a prouder moment than when [PASCAL] was funded, and it just about kills me to see that it may come to an end…losing PASCAL would be a tremendous blow to our institutions."

Richard Shaw, Director of Learning Resources at the Technical College of the Lowcountry, HESC Public Hearing, 2008

Areas of Potential for Synergy/Savings

Introduction

South Carolina's colleges and universities have actively pursued strategies to improve effectiveness through campus-level reorganization, restructuring, and multi-campus collaborations. This section describes a number of additional ideas that are under consideration. Some are largely academic or instructional while others are primarily administrative or operational. The descriptions are brief, but all of these ideas are complex and will require substantial further exploration to determine feasibility. This process is made much more difficult given the severe budget cutbacks experienced in 2008.

Recommendation 4.4. Fund the Partnership Among South Carolina Academic Libraries (PASCAL) fully because it is a critically important partnership among South Carolina's academic libraries.

Since 2004, a state appropriation for PASCAL has provided an electronic research library of over 10 million volumes and access to millions of articles from thousands of electronic research publications. These are available to all faculty, students, and staff of all public and private South Carolina institutions of higher education, as well as to South Carolina residents who visit these libraries. Funds appropriated for PASCAL have been used to pay license fees for 33 databases and to deliver books anywhere in the state within two days of requests being made. Each dollar PASCAL has spent since 2004 on electronic resources has returned about $7 in value in terms of access to resources. If each academic institution in PASCAL had individually purchased the licenses for the 33 databases found in the virtual PASCAL library since 2004, the $4.6 million spent for these licenses by PASCAL would have cost $33 million. PASCAL's academic virtual library is an exemplar of an initiative that is improving and increasing coordination and collaboration in higher education. Since 2004, a $2 million annual appropriation has built a rapid book delivery service and a core electronic research collection that reaches students and faculty across all of the state's public and independent colleges and universities. In FY 2008-09, state funding was reduced by 90%. In these tight economic times, efficient collaborative ventures like PASCAL might be seen as safety nets, ensuring that fundamental educational needs are met with maximum cost effectiveness. Longer term, a program like PASCAL can set the stage for more intensive collaboration across institutions that will promote efficiency, excellence and equity of access.

Academic/ Instructional

Collaborative Approaches to Serving the Adult Education Market

South Carolina has approximately 500,000 adults who have completed some college coursework but hold no degree.[4] Adults, especially those with some college experience, comprise a very different higher education "market" from traditional undergraduates. They are often

3 McGuinnes, Aims C. "Reflections on Postsecondary Governance Changes" (Policy Brief). Education Commission on the States. July 2002.

4 American Community Survey 2007, U.S. Census Bureau Website. [Accessed September 30, 2008.] http://factfinder.census.gov/servlet/DatasetMainPageServlet?_program=ACS&_submenuId=&_lang=en&_ts.

very highly motivated and disciplined and are therefore good candidates for predominantly online programs that are typically not a good fit for younger students. But online education also poses significant challenges: in a high proportion of cases, online programs are more expensive than the regular campus model; and the logistics of "blended" programs that also provide in-person contact (and are widely thought to be superior) are difficult to deploy for adult learners.[5] Led by its ten comprehensive universities, South Carolina could organize to meet this challenge.

One approach could be a Shared Program Model (SPM) such as the ReachHigher program in Oklahoma.[6] In this approach, the comprehensive universities could work together through the SPM to develop new baccalaureate degree programs in popular fields such as organizational management, health care management and similar programs. Each participating university would contribute some of the online courses so that start-up costs would be spread evenly. A contributing university might be responsible for instruction at a given time, depending on the decisions of the group. Students who enroll in a program would be registered at and receive the degree from the university in the area where they reside. The participating university would also sponsor a number of in-person seminars, internships, or other experiences for its students. In some areas, such as Charleston, arrangements would need to be made between and among local institutions. An SPM approach could be constructed in a way that requires very little administrative overhead. The ability to share marketing costs would be a significant advantage.

A Note on Shared Resources

Many of the ideas advanced here describe shared resources. While the S.C. Higher Education Study Committee believes that there is tremendous potential in multi-institutional collaborations, these should also be viewed with some caution. In particular, potential cost-savings have a tendency to evaporate when new administrative overhead appears in the form of state-level bureaucracy. For that reason, it may be better to consider some of these concepts initially at the regional level, where proximity and the easy communication that flows from it will substantially reduce overhead. Once projects have met success, scale-up to the state level may or may not prove to be desirable; in any case, decisions will be made on a much stronger base of experience.

Another strategy to serving the adult education market would be to adopt a model similar to that of the proprietary (for-profit) institutions that appear to be more willing than public or independent institutions to structure themselves to offer such things as flexible schedules (e.g., six-week courses instead of full twelve-week semesters) and other services that appeal to adults. Since the proprietary institutions tend to be very expensive and to restrict offerings to a narrow range of the most popular programs, South Carolina's colleges and universities could work together to respond to the adult education market by creating an entity they own and control. This new institution would probably need to be accredited separately but could be more flexible than traditional institutions in a variety of ways. College and university ownership would ensure that programs complement rather than compete with existing offerings and meet quality standards set by institutional faculty. Careful design could make the new university an efficient, high quality, and low-cost option for adult students.

Western Governors University (WGU) is a good example of an institution that provides services that appeal to adults. The University is a regionally accredited, non-profit online university offering a convenient, flexible online education. WGU was founded by the governors of 19 western states. The University takes into account a student's academic background, career experience, and expected time commitment, all of which are important issues to the adult learner.[7]

The partnership between Kent State University and Ohio University, which expands access to higher education throughout 33 counties in eastern Ohio, appears to have goals similar to those of the proposed Palmetto State University. The Ohio universities' Complete to Compete Program[8] provides adult learners with flexibility by offering classroom-based, web-based and hybrid class formats. Leveraging the resources of each university keeps the cost of these programs affordable. Additionally, the partnership combines and expands the two universities' degree offerings, provides maximum flexibility through distance learning, offers seamless transfer of credits, and extends accelerated degree programs. Together, the universities have 14 campuses, 12 of which are regional or branch campuses.

Administrative/ Operational

Shared ERP systems

Enterprise Resources Planning (ERP) systems are among the most expensive software projects any organization can undertake. These "back-office" systems offer the potential for significant cost-savings but also usually require significant up-front investment. The best current example for sharing inter-institutional costs for technology in South Carolina is the Partnership Among South Carolina Academic Libraries (PASCAL), the statewide higher education electronic library, which has been functioning for five years and resembles the efforts of other states.[9] The efficiencies realized through this process are both monetary and conceptual. Such sharing is based upon the idea that a negotiated group price from a vendor will be a better deal than individual institutions could negotiate, especially since some of the smaller, less well-financed institutions in the partnership otherwise could afford only a small portion of what the group could provide for all.

Part of the potential investment in an ERP, such as software licenses and hardware components, is able to be shared, but the largest expense typically stems from "business process reengineering" which is usually required when moving to a new system.[10] Another major cost associated with moving to a new ERP platform is the conversion of institutional

5 See Recommendation 1.38.

6 ReachHigher Website, (Accessed October 28, 2008) www.okhighered.org/reach-higher. The Center for Adult Learning in Louisiana (CALL) and the Tennessee Regents' Online Degree Program (RODP) serve as a central clearinghouse for online programs offered through their respective state's colleges and universities. The model these programs use is slightly different from the SPM, but represents an alternative approach to baccalaureate degree completion.

7 Western Governors University, "Western Governors University Website (1998-2008) " [Accessed October 28, 2008] www.wgu.edu.

8 Kent State University, *eInside: Excellence in Education*, Complete to Compete Partnership Expands Access to Higher Education (2008), [Accessed October 28, 2008] http://einside.kent.edu/?type=art&id=80074.

9 Most states now have statewide electronic libraries for higher education, but PASCAL is one of the most ambitious in its reach, encompassing all public and private non-profit institutions in the state.

10 Business process reengineering refers to the rethinking of procedures such as document workflow, etc. that is a logical part of moving to new software.

The Critical Importance of PASCAL

"Five years ago, my students could not borrow books from the Medical University of South Carolina without paying to get those books. Because of PASCAL, they are now borrowing those books at no charge, thereby increasing their availability to higher levels of information. That makes my students better at what they do and what's available to them…PASCAL is a wonderful example of the collaboration that exists in this state to give our students the very best that they deserve."

Mrs. Harris C. Murray
Director of Library Services
Orangeburg-Calhoun
Technical College
Claflin University
HESC Public Hearing

"legacy" systems and data which are peculiar to the institution and cannot typically be converted through automated processes. For these reasons, collaborations are unlikely to produce large cost savings with new ERP platforms.

Although conversions are not likely to benefit greatly from collaboration, the long-term costs of running ERP systems may well be offset substantially through shared resources. Colleges and universities should follow industry by carefully investigating the potential of "cloud computing" to reduce system costs. Cloud computing applications are "applications that are extended to be accessible through the Internet. These cloud applications use large data centers and powerful servers that host web applications and web services."[11] Several vendors (e.g., Google[12] and IBM[13]) offer services over the Internet for a fixed cost, freeing users from dealing with licenses, hardware capacity and maintenance.[14]

Common Statewide System to Support Articulation and Transfer

One of the key recommendations made by the Education and Economic Development Coordinating Council's Articulation, Dual Enrollment, High School Graduation and Postsecondary Education Alignment (or "Expanded ACAP") Committee in response to Education and Economic Development Act (EEDA) mandates is to provide automated degree and course audit capabilities through the procurement and implementation of a common statewide course articulation and transfer system. Increased enrollment has led to an increasingly larger number of courses which are transferred each year between and among colleges and universities. According to the National Center for Education Statistics (NCES), "One-half of the undergraduates who start at a public 2-year institution with the intention of obtaining a bachelor's degree and about one-fourth of those who start with an associate's degree goal transfer to a 4-year institution within 6 years."[15] Transfer students need assistance so they can move from one school to another and earn degrees in a timely manner, plan for courses, and reduce the cost of degree completion. By using transfer and articulation technology, institutions can list credit transfer policies and students can explore procedures and rules regarding how academic transcripts will be evaluated. Such an approach would also help to ensure statewide consistency in transfer procedures and policies.

A decentralized electronic advising system provides prospective students and their advisors direct access to information regarding course equivalencies, programs, courses, and degree audits. Such a system can show how courses will transfer from one institution to another and how courses will apply to meet academic program requirements at other institutions in the state. Through the use of an online system that provides degree audit and transfer evaluation automation, students can easily understand which additional courses can be taken at their current institutions to fulfill further requirements at target transfer institutions. The system can develop and promote a systemic process for statewide acceptance of transfer courses and create a plan for transfer pathways. It also will promote increased enrollment, improved retention rates, heightened student knowledge about required courses, and more useful academic advising.

Other shared hardware/software resources

Other areas in which resources can be shared should be actively explored.

Outsourcing

In order to operate programs in the most cost-effective manner, college and university leaders routinely consider opportunities to outsource central campus operations such as bookstores and food services. Colleges and universities are encouraged to continue actively pursuing further outsourcing of activities and, where possible, pursue these collaboratively.

CHE Cost Reduction Committee

The Commission on Higher Education (CHE) will create a Cost Reduction Committee (CRC) with representatives of all colleges and universities. The CRC will meet regularly by videoconference and the CHE will establish a website where participants can share information and discuss possible collaborations.

11 Boss, Greg, Padma Malladi, Dennis Quan, Linda Legregni, and Harold Hall, *Cloud Computing*. (2007), 2. http://download.boulder.ibm.com/ibmdl/pub/software/dw/wes/hipods/Cloud_computing_wp_final_8Oct.pdf.
Young, Jeffery R. "3 Ways Web-Based Computing Will Change Colleges," *Chronicle of Higher Education*. (October 24, 2008). http://chronicle.com/free/2008/10/5611n.htm.

12 Google Apps Education Edition provides e-mail, calendar, and collaboration tools (such as Google Docs which allows anyone to edit documents, spreadsheets, and presentations online from anywhere) directly from the browser. See www.google.com/a/help/intl/en/edu/index.html and www.google.com/a/help/intl/en/edu/demos.html .

13 "IBM Introduces Ready-to-Use Cloud Computing." Nov. 15 2007. www-03.ibm.com/press/us/en/pressrelease/22613.wss .

14 For more information about cloud computing, please refer to *The Tower and The Cloud,* edited by Richard N. Katz, which is available as an Educase e-book at www.educause.edu/thetowerandthecloud/133998 .

15 "Transfers From Community Colleges to 4-Year Institutions," Student Effort and Educational Progress web page, National Center for Educational Statistics web site [Accessed October 28, 2008] http://nces.ed.gov/programs/coe/2003/section3/indicator19.asp.

Conclusion

Higher education is an economic and social benefit to society as a whole and to individuals. The table below summarizes the differences.[1]

Table I: Economic and Social Benefits of Higher Education

	Higher Education as a Public Benefit	Higher Education as an Individual Benefit
ECONOMIC	■ Increased tax revenuew ■ Greater productivity ■ Increased consumption ■ Increased workforce flexibility ■ Decreased reliance on government financial support	■ Higher salaries and benefits ■ More stable employment ■ Higher savings ■ Improved working conditions ■ Personal/professional mobility
SOCIAL	■ Reduced crime rates ■ Increased charitable giving/ service ■ Increased quality of civic life ■ Social cohesion/ Appreciation of diversity ■ Improved ability to adapt to and use technology	■ Improved health/ life expectancy ■ Improved quality of life for children ■ Better consumer decision making ■ Increased personal status ■ More hobbies/ leisure activities

The preceding sections discussing the objectives and recommendations of the four goals have demonstrated that the benefits to investing in higher education are powerful:

- Making South Carolina one of the most educated states will strengthen the state's economic competitiveness and improve income and job security for individuals;
- Increasing research and innovation will create high-paying jobs by bringing additional federal and industrial funds into the state; will assist in attracting, retaining, and starting businesses; and will enhance South Carolina's reputation as a knowledge leader;
- Increasing workforce development and educational services will offer new opportunities to individuals as companies in the fast-growing knowledge-focused business sector expand their operations to include South Carolina.

Analyzing the Value of Higher Education

The Higher Education Study Committee asked the Division of Research at the Moore School of Business at the University of South Carolina to conduct an economic analysis of the Action Plan. Specifically, the Division compared the Action Plan's aspirational goal of becoming one of the most educated states with what would happen if South Carolina remained on the path it is currently on (see Appendix I). Using a thoroughly tested state economic model, the Division calculated changes from increased investment in higher education affecting: state income, gross state product, employment, and tax revenue. The Division constructed a baseline scenario projecting economic effects to 2030 using current data on population by age group and educational attainment; data on the structure of earnings by age group and educational attainment; and population projections for South Carolina by age group. The Division then constructed an alternative scenario where the baseline scenario is modified according to the HESC Action Plan. This scenario calls for a gradual increase in the number of South Carolinians with bachelor's degrees or higher starting in 2013. According to the HESC Action Plan, by 2030 there would be an additional 134,533 residents with bachelor's degrees or higher, of which 56,533 will come from the traditional student pipeline and 78,000 will come from the adult population.

The impact of reaching the 29% goal is striking:

- For each dollar that the state spends between 2010 and 2030, $11.20 is added to the economy (measured by gross state product) over the period. Further, after reaching the goal in 2030, each dollar spent by the state boosts South Carolina's economic activity (measured by gross state product) by $25.20.

Another way of considering the impact is to look at the overall effect on the size of South Carolina's economy:

- In 2030 the annual gain for South Carolina (in 2007 dollars) after reaching the goal is: $6.9 billion in total personal income; $7.8 billion in gross state product; and an additional 44,514 permanent jobs.
- During the time the goal is being reached (2010-2030), the cumulative gain (in 2007 dollars) over the period is: $67.8 billion in total personal income and $77.0 billion dollars in gross state product.

As indicated above, the results of reaching the Action Plan's goal are huge increases in jobs, annual state gross product, and personal income. Higher education also correlates with a host of other positive characteristics and activities in the state, with potentially large benefits to society that include better health care, lower unemployment, and less incarceration. As part of an ongoing study of higher education, the Division will estimate the effects of these and other influences on the economy of South Carolina and its communities.

1 *The Investment Payoff*, Institute for Higher Education Policy (2005), 4.

Investing More in Higher Education

In today's knowledge economy, the proportion of jobs that require only a high school diploma continues to shrink. Furthermore, people with this minimal level of preparation are seeing their wage levels and job stability continually decline as employers outsource to other countries and substitute technology for the simplest tasks. If South Carolina chooses not to act boldly in higher education, it will slip much farther behind economically. Most of the less-educated states have very aggressive plans to sharply increase educational levels (e.g. Texas, Kentucky, and Oklahoma) while already highly educated states such as Massachusetts and New Jersey are making higher education a greater priority. At the same time, the United States, the world's higher education leader in 1980, has now been surpassed by seven countries in degree attainment (Belgium, Canada, Ireland, Japan, Norway, South Korea, and Sweden).[2]

South Carolina must become one of the most educated states, increase research and innovation, and increase workforce development and educational services if it wants to avoid becoming the equivalent of a third world country inside the United States. The good news is that competing in higher education will produce almost immediate benefits – returns on investment that will quickly pay off the initial required funding as well as improve the state's quality of life over the long term.

2 *Hitting Home,* 4.

The Economic Return on Investment in South Carolina Higher Education

Division of Research ■ Moore School of Business ■ University of South Carolina ■ February 5, 2008

The Division of Research in the Moore School of Business at the University of South Carolina (hereafter "Division") has undertaken a study for the Commission on Higher Education (CHE), on behalf of the Higher Education Study Committee (HESC). The CHE is seeking an in-depth analysis focused on determining the return on educational investment for South Carolina. This report presents results of an analysis that forms part of the overall study.

Objective

There is little debate among economists, and most of society, about the individual (personal) economic benefits of higher education. Those individuals who earn bachelor's degrees are much more likely to achieve a higher socio-economic status than their less educated counterparts. Without knowledge gained through higher education, individuals simply cannot compete as well in the job market. With a large educated population, a state or region can be very attractive to innovators, entrepreneurs, and companies that bring jobs not only for the most educated but also for others through indirect benefits.

A study of higher education in the United States by the College Board (Baum and Ma 2007) encapsulates the economic case for improved levels of educational attainment among U.S. citizens. Among the salient points, it found:

- College graduates earn 60 percent more than typical high school graduates. They also receive more in the form of healthcare benefits and retirement plans than typical high school graduates.
- The higher compensation of college graduates leads to increased tax revenue for local, state, and federal governments.
- The decline in employer paid insurance and benefits has been more rapid for high school graduates than college graduates.
- Importantly, workers with lower education levels earn more if others in the same area are more educated.
- Unemployment rates are much lower for college graduates than high school graduates.

An important economic goal in most states, including South Carolina, is raising per capita income. The positive relationship between higher educational attainment for the working population and per capita income is striking. Recent U.S. Census data indicate that the correlation between state per capita income and the share of the working population with bachelor's degrees or higher is 80 percent.[1] It would be hard to find a stronger statistical relationship that could explain state income.

This report estimates the impact of increased higher education attainment for the South Carolina workforce. Specifically, the report looks at the South Carolina goal to be among the top states with its residents holding bachelor's degrees (or higher) by 2030; this means the target is a level of attainment for the workforce that will do the following:

- Reach 29 percent of working age population (ages 25-65) with at least a bachelor's degree;
- Follow a plan that increases both the traditional K-12 pipeline to higher education and also the adult pipeline.

Methods

Using these changing demographic characteristics, the researchers calculated the economic effects of achieving the 2030 goals using conservative assumptions. The economic effects on South Carolina were measured for increases in state income, gross state product, employment, and tax revenue.

The Division constructed a baseline scenario projecting economic effects to 2030 using the following sources:

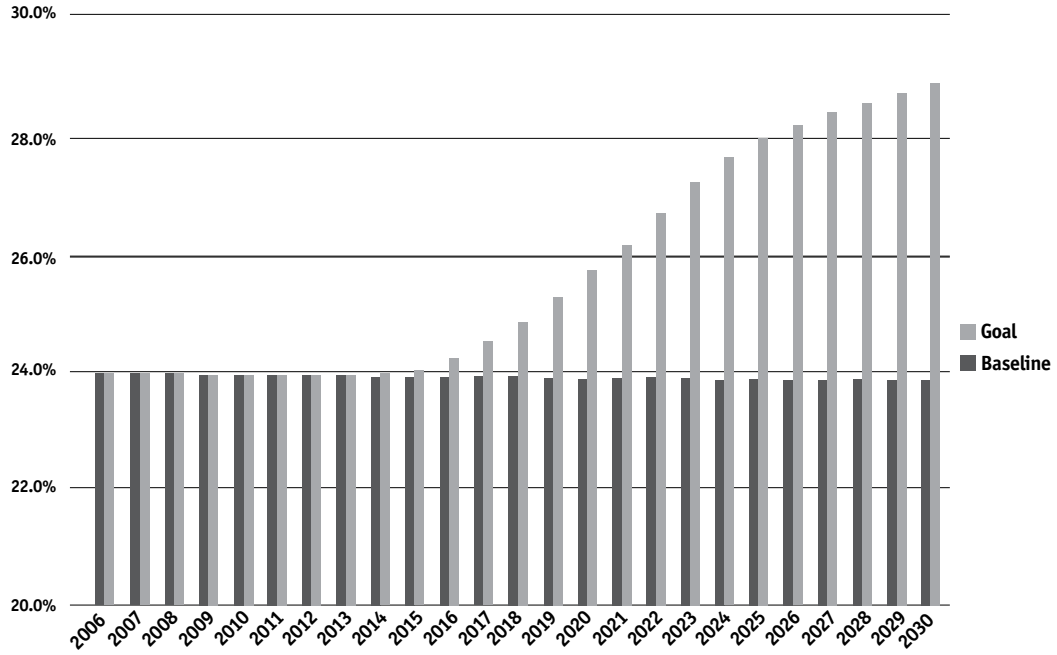
- American Community Survey (ACS) data (2005-2007) on the structure of the South Carolina population by age group and educational attainment;
- ACS data on the structure of earnings by age group and educational attainment in 2007; and
- U.S. Census population projections for South Carolina by age group.

The baseline scenario suggests what will happen if current trends persist. The Division then constructed an alternative scenario where the baseline scenario is modified according to the HESC Action Plan; namely, to reach the goals by 2030 as stated earlier. This scenario calls for a gradual increase in the number of South Carolinians with bachelor's degrees or higher starting in 2013. According to the HESC Action Plan, by 2030 there will be an additional 134,533 residents with bachelor's degrees or higher, of which 56,533 will come from the traditional student pipeline and 78,000 will come from the adult population.

Figure 1 depicts this alternative plan for increasing bachelor's degrees compared with the baseline. Note that South Carolina starts at 24 percent attainment and reaches the 29 percent goal gradually through 2030.

1 This report uses the baccalaureate degree as a metric because it is a consistent standard across states; other degree levels, including associate, graduate and professional also produce important economic benefits as do certificate programs.

Figure 1 : S.C. Percentage of Population with at least a Bachelor's Degree



Results

Given these changes to educational attainment, the economic impact can then be determined. Using a detailed and reliable model of the South Carolina economy, the Division estimated the total impacts associated with the expected increase in earnings (personal income) from greater educational attainment. The expected increase in earnings derives from two sources: the income increase from more education for the individual (the individual benefit) and the additional increase in earnings resulting from a generally more educated population (the societal benefit). As this income is spent in the state, it creates a host of extra benefits. In this report, the benefits are measured in terms of additional personal income, gross state product (the best overall measure of state economic activity), employment, and South Carolina revenue collections. Assumptions underlying the impact analysis can be found at the end of this report.

One of the key results to emerge from the analysis is the return on the South Carolina state government contribution—the funding needed to reach the 2030 goal. It was found that after reaching the 29 percent goal in 2030, each dollar spent by the state boosts South Carolina's annual gross state product by $25.20. As for the cumulative economic effect during the time before reaching the 2030 goal, it was ascertained that for each dollar that the state spends between 2010 and 2030, $11.20 is added to the economy (measured by gross state product) over the period.

Another way to assess the impact is to look at higher education's overall effect on the size of South Carolina's economy. If the attainment goal is reached according to the Action Plan, then by 2030 the annual gain for South Carolina (in 2007 dollars) is:

- $6.9 billion in total personal income;
- $7.8 billion in gross state product; and
- An additional 44,514 permanent jobs.

These results show the annual gain for South Carolina after the goal is reached. During the time the goal is being reached (2010-2030), the cumulative gain (in 2007 dollars) over the period is:

- $67.8 billion in total personal income; and
- $77.0 billion dollars in gross state product.

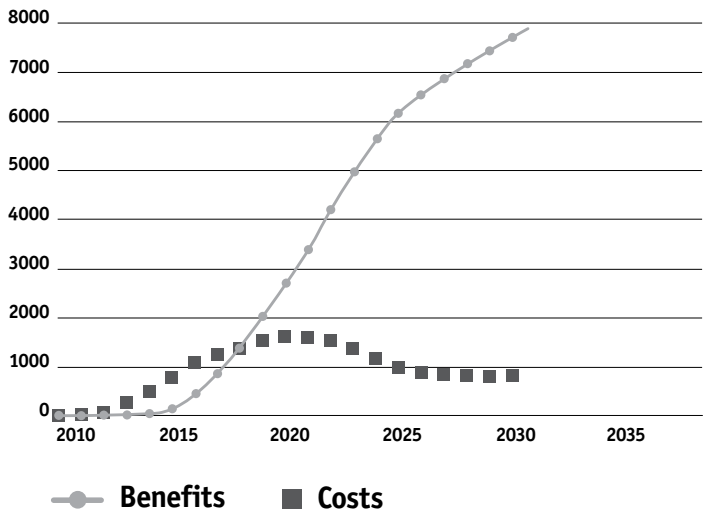
Next, consider the fiscal effects of this greater level of economic activity. In this case, the revenue gain for the government can be seen from its investment in higher education. As the state's investment engenders higher income, in turn higher tax revenues are collected. That is, part of the increase in overall economic activity (and higher gross state product) ends up contributing to government revenue, which provided the support in the first place. The fiscal effects for South Carolina are clearly positive and grow over time, as seen by comparing the annual (2030) and cumulative results (2010-2030):

- South Carolina's government revenue (state and local) brings in $2.70 in taxes in 2030 for each dollar spent by the state.
- The government brings in $1.20 dollars between 2010 and 2030 for every dollar spent.

To get final perspective on the economic effects of higher education, the overall costs and benefits are considered. This analysis evaluates the marginal (additional) individual benefits and the additional societal benefits of enhanced higher educational attainment. First, the additional overall benefits are calculated for the change from the baseline scenario to the alternative scenario. These benefits are then compared with all the marginal (additional) costs associated the greater share of the population with four-year degrees. In this case, the calculation encompasses the total education costs: tuition fees, state appropriations and lost earnings of those individuals going to college.

Figure 2 shows the benefits and costs as the state reaches the 29 percent goal. Note how the total additional benefits outstrip costs over time by a wider and wider margin.

Figure 2 : Direct Marginal Benefits and Costs linked with the Action Plan (millions of 2007 dollars)



Conclusion

In South Carolina, investment in higher education produces palpable economic benefits. It pays for itself and brings in additional revenue for the state over time. The annual benefits the state will gain by reaching the 29 percent attainment goal are significant.

The clearest way to discern the benefits emerging from this analysis is to again stress the overall return on the South Carolina government's investment. For each dollar that the state spends between 2010 and 2030, $11.20 is added to the economy (measured by gross state product) over the period. Further, after reaching the 29 percent goal in 2030, each dollar spent by the state boosts South Carolina's economic activity (measured by gross state product) by $25.20.

Beyond the results presented here, higher education correlates with a host of positive characteristics and activities in the state, with potentially large benefits to society not addressed in this report. These include better health care, lower unemployment, and less incarceration. As part of an ongoing study of higher education, the Division will estimate the effects of these and other influences on the economy of South Carolina and its communities.

References

Baum, Sandy and Jennifer Ma (2007), *Education Pays, The Benefits of Higher Education for Individuals and Society,* College Board, Trends in Education Series, 2007. Washington, D.C.

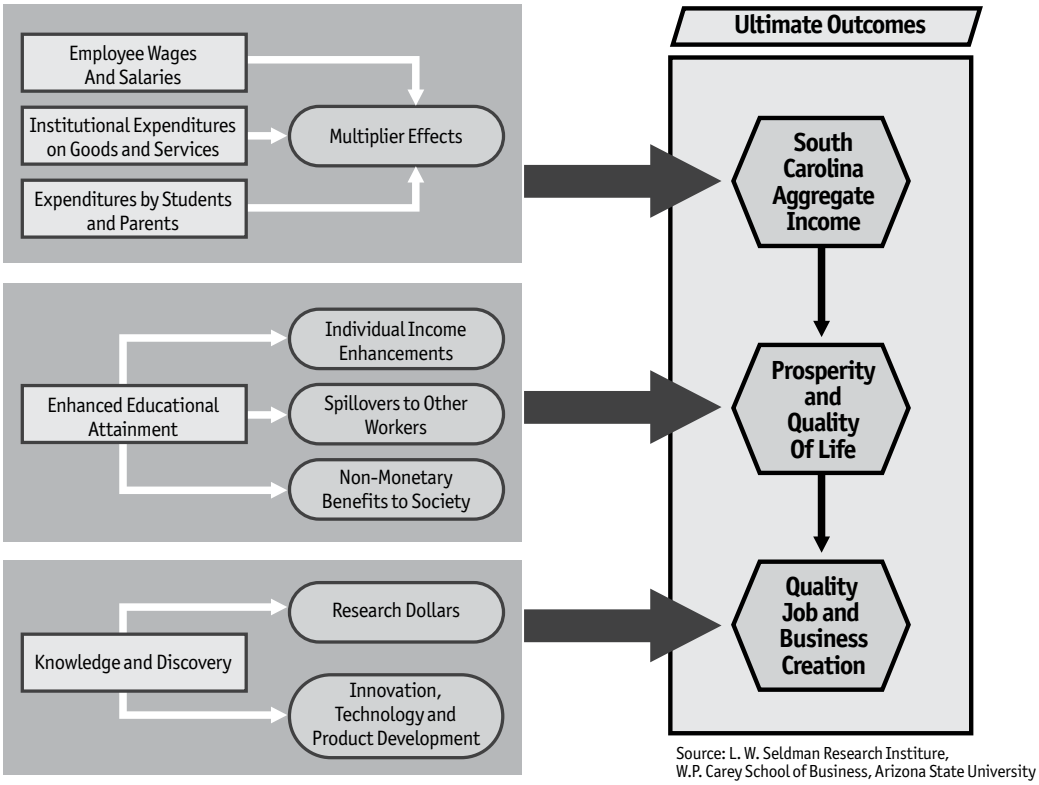
Moretti, Enrico (2004), "Estimating the Social Return to Higher Education: Evidence from Longitudinal and Repeated Cross-Sectional Data." The Journal of Econometrics: 121. 175-212.

Assumptions of the Economic Analysis

The calculations for this study were based on a set of assumptions, the most important being:

- Population will grow according to U.S. Census population projections by age group.
- Under a baseline scenario, the education structure of the age group 25-34 will remain constant.
- Population is uniformly distributed within each age group.
- The earnings differential in 2007 by age group and educational attainment will remain constant over time and will not be affected by the influx of new college graduates.
- Wages and costs will increase at the same rate as the inflation rate.
- The unemployment rates by age group and educational attainment will remain constant over time. This means that there will be sufficient demand for the knowledge and skills of these workers.
- All new college graduates will remain in the state.
- We do not account for the opportunity cost of social investments.
  - In line with the work of Moretti (2004), we assume that an increase in the share of college graduates generates social benefits in terms of higher earnings for all workers.
- We use a conservative estimate of the social benefit.
- We assume that the cost per student will remain the same in spite of the increase in the number of new college graduates (no extraordinary investments necessary).

This report is part of a larger study being conducted by the Division of Research in the Moore School of Business on the economic return to higher education in South Carolina. The following chart provides an overview of the major issues that will be addressed in the research project.



Source: L. W. Seldman Research Institure, W.P. Carey School of Business, Arizona State University

High Priority Recommendations and Action Plan Implementation Matrix

High Priority Recommendations

The Higher Education Study Committee (HESC), through its sub-committees, task forces and public hearings, has developed a comprehensive list of more than 100 recommendations for the advancement of higher education in South Carolina. Although each of these recommendations is the result of a comprehensive process, they are not all of equal priority or potential to affect higher education.

As the final part of the process of developing the recommendations, the HESC members have independently evaluated the recommendations and prioritized them. The input from the individual committee members has been combined to develop an overarching priority list.

For the purpose of setting priorities, the recommendations were divided between those which can be implemented with no additional cost to the state and those which will require either recurring or one-time costs. The top-ranked recommendations are presented below, with the "no-cost" recommendations first, followed by those involving costs. The recommendations within each of these categories will be listed from highest priority down, although it should be noted that all of the recommendations below are seen as high priority by the committee members. Recommendations are identified by the number they have in the Action Plan to ease cross referencing for additional information.

Implementation will involve no cost to the state:

- **2.2. Enact appropriate regulatory relief to enhance innovation and promote research.**
  This recommendation is designed primarily to reduce lag-time and resultant expense in hiring, implementing research programs, building capital projects, and infrastructure improvement.
- **3.1. Align higher education programs to support statewide and regional clusters.**
  Statewide and regional clusters refer to the nine statewide clusters currently identified by New Carolina.
- **1.2. Use and promote the *Knowledge and Skills for University Success* standards as a common standard of college readiness.**
  This recommendation encourages a common standard so that high school faculty members, guidance counselors, principals, and students will be able to understand with some precision what constitutes preparation for collegiate-level work.
- **3.21. Increase opportunities for relevant work experience as part of instructional programs.**
- **2.7. Create a state model for formal agreements between institutions of higher education and the state's business and industry to facilitate shared research and reduce barriers to the commercialization of resulting discoveries and inventions.**
  The recommended model will be designed to copy other states which have been successful in fostering technology transfer and to remove a perceived barrier to such innovation.
- **4.3. To maintain a more accurate picture of higher education funding, state data reporting should clearly distinguish between restricted funds (e.g., funding which is limited to a specific auxiliary activity or by donors or external agencies to a specific purpose) and unrestricted funding (e.g., funding derived primarily from state appropriations for Educational and General [E&G] support and student tuition and fees).**
- **CHE Cost Reduction Committee described under Goal 4**
  This recommendation is intended to facilitate the sharing of information and best practices and to promote the development of collaborations among our colleges and universities.

The HESC anticipated that the following recommendations will involve costs to the state for implementation, although the level of cost for each has not been determined at this time.

Implementation will involve costs to the state:

- **1.21. Ensure affordability of higher education through increased state funding.**
  This recommendation has a triple focus: increased appropriations, a recurring capital bond bill, and increased need-based student aid.
- **3.3. Fund a bond bill to support necessary infrastructure and facilities renovation, maintenance and expansion.**
  This bond bill recommendation is a more tightly focused recommendation aimed at improving and expanding facilities and infrastructure for the purpose of meeting economic development needs.
- **4.4. Fund the Partnership Among South Carolina Academic Libraries (PASCAL) fully because it is a critically important partnership among South Carolina's academic libraries.**
  This recommendation seeks protection for the state's existing but threatened common electronic research library of over 10 million volumes and access to millions of articles from thousands of electronic research publications.
- **1.1. Implement compulsory high school attendance until the age of 18 or high school graduation.**
  While compulsory high school attendance to the age of 18 would be costly because it would require more teachers, more physical facilities, and funding for the number of students in question, the possible benefits which could result from those students earning higher incomes (such as increased tax revenue and decreased use of social services) makes compulsory attendance until the age of 18 a worthy endeavor.
- **1.6. Develop a marketing campaign to promote college attendance and completion.**
  This campaign is intended to sell the need to attend college and increase awareness about higher education opportunities.

- **1.35. Create a "New Front Door" that makes the transition to higher education vastly easier for adults.**
  This recommendation defines a clear, coherent, standardized statewide pathway for adults to further their education.
- **4.1. Fund higher education at the SREB average or above.**
  South Carolina ranks 15th out of the 16 SREB states in per FTE funding for higher education. This recommendation seeks to increase funding to the SREB average rate per FTE.
- **4.2. Support routine and predictable capital funding of colleges and universities with a portion of funding directed at eliminating accumulated maintenance needs.**
  This recommendation also focuses on the need for a recurring bond bill for higher education. In this case, the focus is on capital projects with particular attention paid to "accumulated maintenance needs," in the past known as "deferred maintenance."
- **1.4. Create a South Carolina College Access Network (SC CAN) as a statewide network of local community-based college access programs.**
  This recommendation is designed to engage communities across the state in creating support networks that will encourage and promote a college-going culture.
- **1.20. Expand statewide college application and financial literacy initiatives for high school students to assist in the preparation for college and the transition from high school to postsecondary education.**
  This recommendation is designed to assist high school students and their parents in better understanding the process for applying to college and for financial aid so that they can navigate this critical step in realizing a college education with ease.

Action Plan Implementation Matrix

The recommendations included in this report were evaluated in terms of cost to the state, the agencies responsibility for implementing the recommendation (bold indicates the agencies expected to assume primary responsibility), priority, whether legislation is needed, timeline in which the recommendation is expected to be implemented, and theme. Regarding the timeline, "immediate" is defined as being implemented within one to two years, "mid-range" is defined as three to six years, and "long-term" is defined as greater than six years. The matrix below shows the result of this evaluation.

The high priority recommendations identified above in the list of high priority recommendations are highlighted in the matrix. The high priority recommendations that can be implemented at no cost to the state are shown in light gray; the high priority recommendations that will involve cost are shown in dark gray.

Recommendation	Cost	Responsibility*	Priority	Legislation	Timeline**	Theme
1.1. Implement compulsory high school attendance until the age of 18 or high school graduation.	New costs (on-going)	**Legislature;** SCDE; Dept. of Juvenile Justice	Very High	Yes	Immediate	Policy Development; Access
1.2. Use and promote the Knowledge and *Skills for University Success* standards as a common standard of college readiness.	No new costs	**SCDE; CHE; SCTCS; High Schools; Colleges and Universities**	Very High	No	Immediate	Curriculum; Promotion / Awareness / Marketing; 9-14 Transition
1.3. Identify a common, statewide assessment that high school students can take to identify and remedy gaps in their preparation for college. [See also 1.16.]	New costs (on-going)	**CHE; SCDE;** Colleges and Universities; SCTCS; High Schools	High	No	Immediate	Policy Development; Assessment; 9-14 Transition
1.4. Create a South Carolina College Access Network (SC CAN) as a statewide network of local community-based college access programs. [See also 1.6.]	New costs (on-going); grants and private funds	**CHE**	Very High	No	Immediate	Affordability; Access; Promotion / Awareness / Marketing
1.5. Develop a funding mechanism to expand and enhance offerings for college credit during high school.	New costs (on-going)	**SCTCS; CHE; SCDE**	Lower	No	Mid-range	Affordability; Access; 9-14 Transition
1.6. Develop a marketing campaign to promote college attendance and completion. [See also 1.4, 1.40, and 3.8.]	New costs (on-going)	**CHE**	Very High	No	Immediate	Promotion / Awareness/ Marketing; Access
1.7. Create outreach programs to target ninth graders.	New costs (on-going)	**CHE; SCTCS; SCDE**	High	No	Immediate	Promotion / Awareness/ Marketing; Curriculum; Access; 9-14 Transition
1.8. Produce more and better prepared teachers in all critical needs areas, including more male and minority teachers. [See also 2.4.]	New costs (on-going)	**Colleges and Universities**	Very High	No	Immediate	Access; Curriculum; Affordability; Workforce Development
1.9. Increase the amount of information shared with high schools concerning how their students perform in college.	No new costs	**Colleges and Universities**	Medium	No	Immediate	Data / Systems; Retention; 9-14 Transition
1.10. Restore matching funding and expand services for HEAP, GEAR UP, and other related early awareness and readiness programs.	New costs (on-going)	**Legislature;** CHE; Colleges and Universities	High	No	Immediate	Promotion / Awareness/ Marketing, Curriculum; Access; 9-14 Transition

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Recommendation	Cost	Responsibility*	Priority	Legislation	Timeline**	Theme
1.11. Continue to support EEDA initiatives, including dual/concurrent enrollment, transfer and articulation, college course alignment, and other related projects.	New costs (on-going)	**Legislature;** CHE; SCDE; SCTCS; Colleges and Universities; Employment Security Commission; Dept. of Commerce	High	No	Immediate	Curriculum; Retention; Economic Development; 9-14 Transition
1.12. Promote more rigorous high school coursework.	New costs (on-going)	**SCDE; High Schools**	Very High	No	Immediate	Curriculum; Access; Retention
1.13. Align college course prerequisites with high school graduation requirements and sequence undergraduate general education requirements so that they are linked with appropriate high school senior-year courses. [See also 1.17 and 3.26.]	New costs (on-going)	**Legislature; SCDE; High Schools; CHE; SCTCS; Colleges and Universities**	High	Yes	Immediate	Curriculum; Access; Retention; 9-14 Transition
1.14. Improve high school course-taking patterns and monitor results.	New costs (one-time)	**SCDE**; High Schools; Colleges and Universities	High	No	Immediate	Curriculum; Data / Systems
1.15. Expand and enhance student transition programs to reduce repetition of courses or course content and attrition.	New costs (on-going)	**SCDE; High Schools; CHE; SCTCS; Colleges and Universities;**	Lower	No	Mid-range	9-14 Transition
1.16. Develop statewide policies for assessing college readiness levels. [See also 1.3.]	No new costs	**SCTCS;** CHE; SCDE; Colleges and Universities	High	No	Immediate	Policy Development; Assessment; 9-14 Transition
1.17. Foster a college-going culture in high school by developing and implementing activities such as senior seminars. [See also 1.13.]	New costs (on-going)	**High Schools; School Districts; Colleges and Universities**	Medium	No	Mid-range	Curriculum; 9-14 Transition
1.18. Create a P-20 council.	New costs (on-going)	**Governor's Office; Legislature;** SCDE; CHE; SCTCS; SCICU; K-12; Colleges and Universities; EOC; Chamber of Commerce; Others	Medium	Yes	Mid-range	Policy Development
1.19. Create a longitudinal data system.	New costs (on-going)	**SCDE; CHE;** SCTCS; K-12; Colleges and Universities	High	Yes	Mid-range	Data / Systems
1.20. Expand statewide college application and financial literacy initiatives for high school students to assist in the preparation for college and the transition from high school to postsecondary education.	New costs (on-going)	**Colleges and Universities;** CHE; SCDE	Medium	No	Immediate	Access; 9-14 Transition

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1.21. Ensure affordability of higher education through increased state funding. [See also 2.18, 3.3, and 4.2.]	New costs (on-going)	**Legislature**; Colleges and Universities	Very High	Yes	Immediate	Access; Affordability
1.22. Create incentives and requirements for seamless student transitions between and among two-year and four-year institutions, including the implementation of a statewide initiative to monitor transfer effectiveness. [See also 3.22.]	New costs (on-going)	**Legislature; CHE; SCTCS;** Colleges and Universities	Medium	Yes?	Mid-range	Policy Development; Access
1.23. Implement the state-funded Course Articulation and Transfer System (CATS) at the earliest possible opportunity in order to improve the efficiency and effectiveness of transfer processes, to reduce time-to-degree, and to monitor progress to degree completion.	New costs (on-going)	**CHE;** SCTCS; Colleges and Universities	High	No	Immediate	Data / Systems and Access
1.24. Increase alternative delivery methods of appropriate courses and/or programs to reach underserved students, especially non-traditional students, and create greater flexibility as to the time and location of the learning process.	New costs (on-going)	**Colleges and Universities**	High	No	Immediate	Access
1.25. Promote timely degree completion by establishing appropriate credit hour maximums.	No new costs	**Legislature; Colleges and Universities; CHE**	Medium	Yes?	Mid-range	Policy Development; Curriculum
1.26. Promote additional options for timely degree completion such as expanding the use of test-out provisions (including College Level Examination Program examinations) and awarding credit based on life experience	No new costs	**Colleges and Universities**	Lower	No	Mid-range	Policy Development; Assessment
1.27. Redesign academic programs to improve student results while reducing costs through the exploration of course redesign initiatives. [See also 3.27.]	New costs (one-time)	**Colleges and Universities; CHE**	High	No	Immediate	Curriculum; Retention
1.28. Provide more effective developmental education. [see also 1.2, 1.3, 1.12, 1.14, and 1.16.]	No new costs	**Colleges and Universities**	High	No	Immediate	Curriculum; Retention
1.29. Develop and monitor institutional retention plans for student success.	No new costs	**Colleges and Universities;** CHE	Lower	No	Immediate	Policy Development; Retention

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1.30. Create legislative incentives (tax credits, tuition rebates for degree completion, etc.) to encourage students to earn an academic certificate or degree, especially for students who remain in South Carolina for a certain period of time following degree completion.	New costs (on-going)	**Legislature**	High	Yes	Immediate	Access; Affordability; Economic Development
1.31. Create an early warning system at institutions of higher education to prevent student withdrawal during first semester of first year.	No new costs	**Colleges and Universities**	Lower	No	Immediate	Retention
1.32. Increase availability of applied baccalaureate degrees to meet workforce needs and increase available pathways in order to bolster educational attainment for associate degree holder	New costs (on-going)	**Colleges and Universities;** CHE	High	No	Mid-range	Curriculum; Access; Workforce Development
1.33. Explore how the higher education funding mechanism could be structured better to support student success more effectivel	No new costs	**CHE;** Colleges and Universities	High	No	Immediate	Policy Development; Retention
1.34. Add a new component in the higher education funding model to increase support of college readiness services such as tutoring, coaching, math and reading labs, academic success/ learning success centers, computer and technology labs, mentoring, and other supplemental instruction.	New costs (on-going)	**CHE;** Colleges and Universities	Lower	No	Immediate	Policy Development; Retention
1.35. Create a "New Front Door" that makes the transition to higher education vastly easier for adults. [See also 2.14, 3.10, and 3.21.]	New costs (on-going)	**CHE; SCTCS;** Colleges and Universities	Very High	No	Immediate	Access; Curriculum; Workforce Development
1.36. Provide state financial aid and/or state grants targeted to adult learners. [See also 3.19.]	New costs (on-going)	**Legislature; CHE**	High	Yes	Immediate	Access; Affordability
1.37. Create statewide policies for assessing prior knowledge, on-campus residency requirements, and course credit expiration.	No new costs	**CHE; SCTCS;** Colleges and Universities	Lower	No	Mid-range	Policy Development; Access
1.38. Develop a coordinated set of blended online/on-campus degree programs delivered cooperatively through different institutions.	New costs (one-time)	**Colleges and Universities;** CHE; SCTCS	Medium	No	Mid-range	Curriculum; Access
1.39. Create a web portal that serves as a clearinghouse of information for adult learners. [See also 3.24.]	No new costs	CHE; SCTCS; SCDE; **EEDA Coordinating Council;** Colleges and Universities	Lower	No	Immediate	Access; Promotion / Awareness / Marketing

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1.40. Develop coordinated outreach programs that focus on adults without college degrees. [See also 1.6.]	New costs (on-going)	**Colleges and Universities**	High	No	Immediate	Access; Promotion / Awareness / Marketing
1.41. Create a centralized transcript repository.	New costs (on-going)	**CHE**	Medium	No	Long-term	Data / Systems
1.42. Implement a cooperative, statewide initiative to reduce gaps in technological literacy among potential adult learners.	New costs (on-going)	**Colleges and Universities**; CHE; SCTCS; SCDE	Medium	No	Immediate	Curriculum; Access
1.43. Create multiple, diverse internships, cooperative work programs, and registered apprenticeship programs for students. [See also 2.20.]	No new costs	**Dept. of Commerce; Business and Industry;** Colleges and Universities; SCTCS; EEDA Coordinating Council	High	No	Immediate	Curriculum; Access; Business and Higher Education Interaction; Workforce Development
1.44. Create a Fulbright-like scholarship program to attract international students in knowledge-based clusters. [See also 2.20.]	New costs (on-going)	**Legislature**; CHE; Colleges and Universities	High	Yes	Mid-range	Policy Development
1.45. Increase higher education operating funding to allow institutions to offer graduate student stipends that are nationally competitive. [See also 2.20.]	New costs (on-going)	**Legislature**	High	No	Mid-range	Affordability; Retention; Access
1.46. Create a low cost online program to develop proficiency in at least four important foreign languages (e.g., Mandarin, Spanish, French, German, etc.) to promote economic development, cultural knowledge, and tolerance.	New costs (on-going)	**CHE; Colleges and Universities;** Business and Industry; Chamber of Commerce	Medium	No	Mid-range	Curriculum; Economic Development; Business and Higher Education Interaction
1.47. Initiate new graduate programs to support new clusters and to attract talented individuals from other states and countries to South Carolina. [See also 2.20.]	New costs (on-going)	**Colleges and Universities**; CHE	Lower	No	Mid-range	Curriculum; Economic Development
1.48. Increase opportunities for loan-forgiveness programs. [See also 2.20.]	New costs (on-going)	**Legislature**; CHE	Medium	Yes	Mid-range	Affordability; Access
1.49. Develop a system scale-up plan.	New costs (on-going)	**CHE**	High	No	Mid-range	All

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2.1. Create opportunities for communication and "cross-fertilization" between and among institutions of higher education and the state's major industries to encourage idea sharing, on-site explorations, and formal partnership agreements.	New costs (on-going)	**Business and Industry; Colleges and Universities**	High	No	Immediate	Economic Development; Business and Higher Education Interaction
2.2. Enact appropriate regulatory relief to enhance innovation and promote research.	No new costs	**Legislature**; CHE; Colleges and Universities	Very High	Yes	Immediate	Policy Development
2.3. Engage more undergraduates in research.	New costs (on-going); grants and private funds	**Colleges and Universities**	Medium	No	Immediate	Curriculum
2.4. Produce greater numbers of teachers in all critical needs areas, especially in Science, Technology, Engineering and Mathematics (STEM) disciplines, including more male and minority teachers.	New costs (on-going)	**Colleges and Universities**	Very High	No	Immediate	Access; Curriculum; Retention
2.5. Integrate entrepreneurship into curricula at colleges and universities (especially in programs in the liberal arts and STEM disciplines).	No new costs	**Colleges and Universities**	Lower	No	Immediate	Curriculum
2.6. Develop a system of "Research Sabbaticals" for faculty from comprehensive teaching institutions.	New costs (on-going)	**Colleges and Universities**	Medium	No	Mid-range	Faculty; Business and Higher Education Interaction
2.7. Create a state model for formal agreements between institutions of higher education and the state's business and industry to facilitate shared research and reduce barriers to the commercialization of resulting discoveries and inventions.	No new costs	**Colleges and Universities; Business and Industry**	High	No	Immediate	Policy Development; Business and Higher Education Interaction; Economic Development
2.8. Review and/or revise Intellectual Property (IP) policies based upon successful models at other research institutions (e.g., Georgia Tech, North Carolina State University, and the University of Kentucky).	No new costs	**Colleges and Universities**	High	No	Immediate	Policy Development
2.9. Broaden the scope of the South Carolina Research Authority (SCRA) and SC Launch! to encourage and support research and technology transfer across all South Carolina institutions of higher education.	New costs (on-going)	**Legislature;** SCRA	Lower	Yes	Mid-range	Policy Development; Business and Higher Education Interaction

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2.10. Establish Enterprise Campuses at technical colleges statewide.	New costs (on-going)	**Legislature**; SCTCS	High	Yes	Immediate	Economic Development; Business and Higher Education Interaction
2.11. Increase communication, shared programs, and formal partnerships among institutions of higher education.	New costs (on-going)	**Colleges and Universities**	High	No	Immediate	Economic Development
2.12. Create or use existing local **higher education/ industry advisory boards to identify potential research, collaboration, and consulting opportunities.** [See also 3.6.]	No new costs	**Colleges and Universities**; Business and Industry; other Economic Development Entities	High	No	Immediate	Economic Development; Business and Higher Education Interaction
2.13. Provide creative incentives to industries to collaborate with SC research institutions. [See also 3.6.]	New costs (on-going)	**Legislature**; Dept. of Commerce; Research Institutions	High	Yes	Immediate	Policy Development; Economic Development; Business and Higher Education Interaction
2.14. Expand existing and/or develop new STEM programs which reflect the economic needs of the state. [See also 2.17, 2.20, and 3.28.]	New costs (on-going)	**Colleges and Universities; CHE**	High	No	Mid-range	Curriculum; Economic Development
2.15. Encourage businesses, colleges, and universities to apply for more Small Business Innovation Research (SBIR) and Small Business Technology Transfer Program (STTR) grants through the South Carolina Department of Commerce.	No new costs	**Colleges and Universities**; Dept. of Commerce; Business and Industry	Lower	No	Immediate	Economic Development; Business and Higher Education Interaction
2.16. Establish a South Carolina Energy Independence Consortium to promote collaboration and the sharing of energy-related expertise and to research and develop innovative energy systems through the South Carolina Energy Office.	New costs (on-going)	**Legislature;** Colleges and Universities; SC Energy Office;	High	Yes	Immediate	Economic Development; Business and Higher Education Interaction
2.17. Recruit and retain more students in the state's existing science, technology, engineering, and mathematics (STEM) programs to facilitate increased enrollment. [See also 2.14, 2.20, and 3.28.]	New costs (on-going)	**Colleges and Universities;** Business and Industry	High	No	Immediate	Retention; Curriculum; Access
2.18. Revitalize and expand the universities' research infrastructure. [See also 1.21, 3.3, and 4.2.]	New costs (on-going)	**Legislature; Research Institutions**	Very High	Yes	Immediate	Economic Development; Facilities
2.19. Develop or expand programs to increase the number of women and minorities in engineering, math, and science. [See also 2.14, 2.17, 2.20, and 3.28.]	New costs (on-going)	**Colleges and Universities**	High	No	Immediate	Promotion / Awareness/ Marketing; Curriculum; Access

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2.20. Create innovative scholarship programs and pathways to attract and retain top-notch graduate students. [See also 1.43, 1.45, 1.46, 1.47, 1.48, 2.14, 2.17, and 3.28.]	New costs (on-going)	**Legislature;** CHE; Colleges and Universities	High	Yes	Immediate	Affordability; Access
2.21. Ensure that faculty entrepreneurial activities and industry-related research are recognized in the tenure and promotion process.	No new costs	**Colleges and Universities;** CHE	High	No	Immediate	Policy Development; Faculty
2.22. Build upon the SC Centers of Economic Excellence (CoEE) Program to stimulate research and innovation.	New costs (on-going)	**Legislature;** CoEE Review Board; Colleges and Universities	Very High	Yes	Immediate	Economic Development; Business and Higher Education Interaction
2.23. Enact a statutory change to authorize tuition relief for faculty dependents and tuition reciprocity with peer institutions in order to increase competitiveness in recruiting and retaining faculty. [See also 2.2.]	New costs (on-going)	**Legislature;** CHE	Medium	Yes	Mid-range	Policy Development; Faculty
2.24. Improve faculty pay and compensation. [See also 3.4.]	New costs (on-going)	**Legislature;** Colleges and Universities	High		Immediate	Policy Development; Faculty
3.1. Align higher education programs to support statewide and regional clusters.	No new costs	**Colleges and Universities; CHE; SCTCS; SC Council on Competitiveness**	High	No	Immediate	Curriculum; Workforce Development
3.2. Develop or expand higher education programs to support cluster growth, especially in workforce shortage areas.	New costs (on-going)	Colleges and Universities; Business and Industry; SCTCS; CHE	High	No	Immediate; Mid-range; Long-term	Curriculum; Workforce Development
3.3. Fund a bond bill to support necessary infrastructure and facilities renovation, maintenance and expansion. [See also 1.21, 2.18, and 4.2.]	New costs (on-going)	**Legislature**	Very High	Yes	Immediate	Facilities; Economic Development; Affordability
3.4. Develop sources of funding to hire additional and replacement faculty, especially in fields that produce graduates for occupations in key clusters and critical areas. [See also 2.24.]	New costs (on-going)	**Legislature; Colleges and Universities; Business and Industry**	High	No	Immediate	Faculty; Workforce Development
3.5. Improve student recruitment into high demand occupations which support targeted clusters.	New costs (on-going); private funds	**Colleges and Universities; K-12; Business and Industry**	High	No	Mid-range	Promotion / Awareness / Marketing; Curriculum; Workforce Development
3.6. Identify and implement ways for higher education and industry to communicate about workforce needs. [See also 2.12 and 2.13.]	No new costs	**Business and Industry; Colleges and Universities;** CHE; SCTCS; SCICU; SCDE; Dept of Commerce; SC Council on Competitiveness	High	No	Mid-range	Workforce Development; Business and Higher Education Interaction

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3.7. Implement an aggressive public relations and communications plan targeted to both the policymakers who would support and fund the Action Plan and the citizens who would benefit directly from the successful implementation of the Action Plan.	New costs (on-going); private funds	**CHE; SCTCS; SCICU; Colleges and Universities; SC Council on Competitiveness; External Marketing Agency**	Lower	No	Immediate	Promotion / Awareness / Marketing
3.8. Develop a compelling united message from all institutions of higher education to the targeted stakeholders to ensure broad understanding of the critical relationship between education and the state's economic future. [See also 1.6.]	New costs (on-going); private funds	**CHE; SCTCS; SCICU; Colleges and Universities; SC Council on Competitiveness; External Marketing Agency**	Very High	No	Immediate	Promotion / Awareness / Marketing
3.9. Allow the state's technical colleges to provide an additional path for adults seeking to obtain a General Education Development (GED®) diploma.	New costs (on-going)	**Legislature; SCTCS; Technical Colleges; SCDE**	High	Yes	Immediate	Policy Development; Access; Curriculum
3.10. Implement fully the certificate system as proposed in the "New Front Door" CHE white paper for adults seeking to gain higher level employment skills. [See also 1.35.]	New costs (on-going)	**CHE; SCTCS**; Colleges and Universities;	High	No	Immediate	Curriculum; Access; Retention; Workforce Development
3.11. Implement fully the South Carolina Technical College System's *Adult Pathways* initiative.	New costs (on-going)	**SCTCS**	High	No	Mid-range	Curriculum; Access; Retention; Workforce Dev ent
3.12. Implement fully both components of the South Carolina Technical College System's *competeSC* initiative: QuickJobs Carolina and Retool Carolina.	New costs (on-going)	**SCTCS**	Medium	No	Long-term	Curriculum; Workforce Development
3.13. Support the timely implementation of the *Kuder Journey* system.	New costs (on-going)	**SCDE; SCTCS; SC Student Loan Corp.**	High	No	Immediate	Promotion / Awareness / Marketing; Workforce Development
3.14. Develop and implement a comprehensive statewide education plan to facilitate the reentry into society and the workforce of those who have been incarcerated.	New costs (on-going)	**Legislature**; SCTCS; CHE; Dept. of Corrections; Probation, Pardon and Parole; Colleges and Universities	Very High	Yes	Long-term	Policy Development; Access; Workforce Development
3.15. Support the statewide implementation of the Department of Commerce's WorkReadySC, including the WorkKeys credentialing program.	New costs (on-going)	**Dept. of Commerce; SCTCS**	Medium	No	Immediate	Workforce Development

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3.16. Determine whether the state's higher education institutions have the necessary capacity to satisfy the expanding need for adult career counselors.	New costs (one-time)	**CHE; Colleges and Universities**	Lower	No	Immediate	Workforce Development
3.17. Conduct a comprehensive analysis of financial pathways and barriers.	New costs (one-time)	**CHE**	High	No	Immediate	Access; Affordability
3.18. Construct a model indicating categories of students entering postsecondary education and the types of training that they will need to meet the state's workforce demands.	No new costs	**CHE; SCTCS; SCDE; WIA Boards, Voc Rehab, SC Student Loan Corp, Others**	Lower	No	Long-term	Workforce Development
3.19. Enact legislation to close financial aid gaps in order to make relevant education and training available for all adults. [See also 1.36.]	New costs (on-going)	**Legislature**; CHE; SCTCS; Colleges and Universities; Chambers of Commerce; Business and Industry	Very High	Yes	Immediate	Access; Affordability; Workforce Development
3.20. Encourage further use of best practices in learning-centered teaching including community and problem-based research, service learning, interdisciplinary course models, study abroad integration, intensive writing, and creative inquiry.	No new costs	**Colleges and Universities**	Lower	No	On-going	Curriculum
3.21. Increase opportunities for relevant work experience as part of instructional programs. [See also 1.35.]	No new costs	**Colleges and Universities; Business and Industry (Connect2Business)**	High	No	Immediate	Curriculum; Workforce Development
3.22. Develop a reverse bridge pathway from four-year to two-year institutions to provide students enrolled in liberal arts programs and liberal arts graduates access to practical, technical and hands-on training in order to match their range of skills with workforce needs. [See also 1.22.]	No new costs	**SCTCS; CHE; Colleges and Universities**	Lower	No	Immediate	Policy Development; Access; Retention
3.23. Develop a comprehensive listing of credit and non-credit academic programs, services, and resources of South Carolina higher education institutions that assist in addressing the diverse needs of a developing workforce.	New costs (on-going)	**Colleges and Universities; CHE; SCTCS; SCICU**	Lower	No	Long-term	Data / Systems

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3.24. Develop a central website which interested persons or employers may use to find higher education programs, providers, instructions, links to helpful sites and other information relevant to workforce needs. [See also 1.39.]	New costs (on-going)	**EEDA Coordinating Council / SCDE; CHE; SCTCS; SCICU; Colleges and Universities**	Medium	No	On-going	Data / Systems
3.25. Create a branding/ marketing plan for the purpose of attracting citizens and employers to the workforce and for communicating the direct and indirect value of these services to communities and a strong workforce.	New costs (on-going); private funds?; pro bono?	**External Marketing Agency**	Medium	No	Mid-range	Promotion / Awareness / Marketing; Workforce Development
3.26. Develop an innovative and flexible mathematics curriculum that makes it easier for undergraduate students and entering adults to consider scientific and technical majors. [See also 1.13.]	No new costs	**Colleges and Universities**	Very High	No	Immediate	Curriculum; Access; Retention; Workforce Development
3.27. Increase the productivity of gateway science and mathematics courses. [See also 1.27.]	New costs (one-time)	**Colleges and Universities**	High	No	Immediate	Curriculum; Retention
3.28. Increase the participation of underrepresented populations in science and technology fields. [See also 2.14, 2.17, 2.19, and 2.20.]	New costs (on-going)	**Colleges and Universities; CHE**; SCTCS; SCAMP	High	No	Immediate	Promotion / Awareness / Marketing; Access; Curriculum; Workforce Development
3.29. Develop a statewide undergraduate minor in computational science.	New costs (on-going)	**Colleges and Universities; CHE**	High	No	Immediate	Curriculum
4.1. Fund higher education at the SREB average or above.	New costs (on-going)	**Legislature**	Very High	No	Immediate	Policy Development; Workforce Development; Economic Development; Affordability; Access
4.2. Support routine and predictable capital funding of colleges and universities with a portion of funding directed at eliminating accumulated maintenance needs. [See 1.21 and 3.3.]	New costs (on-going)	**Legislature**	Very High	Yes	Immediate	Affordability; Access; Facilities

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Recommendation	Cost	Responsibility*	Priority	Legislation	Timeline**	Theme
4.3. To maintain a more accurate picture of higher education funding, state data reporting should clearly distinguish between restricted funds (e.g., funding which is limited to a specific auxiliary activity or by donors or external agencies to a specific purpose) and unrestricted funding (e.g., funding derived primarily from state appropriations for Educational and General [E&G] support and student tuition and fees).	No new costs	**Legislature; Governor's Office; CHE**	High	No	Immediate	Policy Development; Data / Systems
4.4. Fund the Partnership Among South Carolina Academic Libraries (PASCAL) fully because it is a critically important partnership among South Carolina's academic libraries.	New costs (on-going)	**Legislature**	Very High	No	Immediate	Data / Systems; Access; Affordability; Workforce Development; Economic Development; Curriculum; 9-14 Transition

*** Bold indicates primary responsibility.**

**** Immediate is defined as starting within 1-2 years, Mid-range is 3-6 years, and Long-term is greater than six years.**

High priority recommendations that can be implemented at no cost are shown in light gray; those that will involve cost are shown in dark gray

Higher Education Needs a "New Front Door" for Adults

Dr. Garrison Walters, CHE Executive Director

Educating more adults, by which I mean people 21 or over who lack college degrees, has to be at the top of South Carolina's agenda for achieving competitiveness in today's knowledge economy.

Even if South Carolina were to somehow immediately increase its high school graduation, college-going, and college graduation rates (two- and four-year) to the highest levels in the country, we would still be 112,000 degrees short of economically competitive education levels in 2025.

What about doing something for the more than a million people in South Carolina who are between the ages of 25-54 (peak working years) and who lack the college education—degree or certificate—that is needed for today's high wage jobs?

Colleges and universities do have many programs to support non-traditional students, but we need to reach much more of the potential audience. How?

First, we have to recognize that our target adult audience lacks confidence in their abilities. Many were poor students in high school and as a result fear that they cannot ever succeed. The reality, of course, is that most are quite capable but their high school work was hobbled by immaturity—they didn't realize learning was important.

Second, these potential students are usually working or have family responsibilities or both. Finding the time for traditional class work is a big challenge for them.

Third, adults lacking college education generally have limited financial resources and, even with financial aid, can't afford to enroll at current prices.

Fourth, adults are often unwilling to take the risk to go to college because they don't see any near-term relevance to their employability or job advancement.

So, what's a solution? Let's build a system of certificates that: 1) provides credit for relevant existing knowledge and abilities;
2) are no-fail; 3) are flexibly scheduled; 4) are low or no-cost; and 5) includes content of relevance to people in today's workplace.

No-fail for these early courses is critical—it will send message to these folks that we really want them to succeed. Standards will remain high—grades are "pass" or "not yet."

Including knowledge that's immediately applicable to work—core information technology skills and instruction in critical thinking (the ability to analyze and evaluate information) will enhance employability.

The certificates would give adults a "you are here" map that is as easy to understand as grades in school, except that there would be choices: take a traditional college program or go to advanced training. And, if you choose training, most of the work could transfer back to a college program. There must be "no wrong door" for adults.

The certificate system could be offered by a wide array of providers across the state. Standardized certificates would have clear meaning to employers (who would help define them) and the new system would have the scale to be marketed effectively. Many of today's local programs are very strong and effective, but lack of critical mass makes it hard to advertise to a clientele that needs effective persuasion far more than most. To increase accessibility, some certificates or parts of certificates could be offered by an array of providers, including businesses working under the aegis of a technical college.

Solving the adult education problem will take a lot of work, but the good news is that there's a real commitment to change. The Commission on Higher Education, the Technical College system, the Department of Education, the Department of Commerce, and others are all working together under the leadership of New Carolina to develop a bold strategy that will move our state forward—and soon. Your ideas are most welcome.

Preparing Liberal Arts Graduates for Business Employment

Issue: Liberal arts graduates from South Carolina colleges and universities could benefit from specific preparation for work in business, especially in the cluster areas that are the state's greatest employment priority. Currently, following the recommendations put forward by the Association of American Colleges and Universities in their Greater Expectations Report and through their LEAP Initiative (Liberal Education and America's Promise), many institutions are recognizing the many practical skills that are part of a traditional liberal education (quantitative reasoning, critical thinking and writing, communication, group process and leadership, ethical reasoning, foreign language competencies, analytical and synthetic skills, etc.) To emphasize the use of these skills, institutions of higher education are building capstone experiences, internships, service learning, and civic engagement elements into their academic programs. These applications of knowledge and skills gained in liberal arts and sciences majors and minors and in interdisciplinary programs should be encouraged and expanded.

Certificate Concept: One way to do this would be to create a special capstone-type certificate that students would normally take immediately prior to or immediately after graduation. The certificate would also be available to past graduates seeking preparation for re-employment.

Key Question: Would the capstone certificate be offered in a regular academic format - a semester or so - or in a "lite" online version that would not go into much depth?

Investigation Process: For efficiency, much or all of this consultation could be accomplished via e-mail and video/or telephone conferencing.

- Convene a group of university business professors and ask what useful content could be provided to prepare liberal arts graduates for business employment. The depth of the certificate, as described above in "Key Question" would likely be the initial topic from which other decisions flow. Prior to meeting, the group would compile information about existing programs across the nation.[1] The outcome of the meeting would be a draft document.
- The Chamber of Commerce would convene a consultation of business representatives to consider the university draft. Their comments would be added to a revised version.
- The university group would meet to consider the business suggestions, and then make revisions as appropriate.
- The university and business groups would meet together for final review and approval.

The process might be longer or shorter depending on whether existing programs have appeal and on whether agreement could be reached on key issues.

Second Stage: In a second stage, New Carolina would consult with cluster representatives as to whether an additional certificate, almost certainly short-term and online, could be developed in a way that would strengthen employment for their areas.

Engaging the Higher Education Community, the CHE should utilize ACAP to study this potential direction for liberal education by providing workshops that bring experts to demonstrate best practices and benchmarks/ metrics that are transferable to South Carolina colleges and universities. Dr. George Kuh, the Director of the National Survey of Student Engagement (NSSE) has recently reviewed the practices identified through NSSE results to have had the most benefit to students to prepare them for engagement as active citizens and as a skilled workforce. The results of his research could be used to engage faculty and administrators in South Carolina in designing a variety of capstone experiences, to include the proposed certificate program, as a way of providing students in the liberal arts and sciences with the opportunity to bridge from their academic major to entering the workforce, especially in the New Carolina clusters.

1 The University of Oregon's minor in business illustrates such an approach. See http://lcb.uoregon.edu/undergrad/minor/requirements.html.

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Both the *Action Plan Implementation* report and the September 15th *Action Plan Framework* report will be available on the South Carolina Commission on Higher Education's website at **www.che.sc.gov/HigherEd_ActionPlan.htm.**