



## **Positioning Florida to Compete for High Tech Industries**

### **Executive Summary**

- Other states are actively implementing policies to improve their ability to attract knowledge-based industries, from investments in the education infrastructure of the state to incentives to attract high-tech industry.
- In the past, a state's economy was often dependent on its natural resources. Under the new economy, a state's economic health is more often dependent on its human resources. Policy makers are often slow to recognize this critical shift.
- The educational attainment of a state's citizens, from high school diplomas to Ph.D. degrees, is correlated to a state's economic competitiveness.
- Florida lags behind most states in key education measures, including high school graduation rates, student achievement in science and mathematics, and the percent of the population with college degrees.
- Leading organizations, such as the Florida Chamber of Commerce, national independent economic and education think tanks (Milken Institute, National Center for Public Policy and Higher Education) and the National Science Foundation have issued reports that conclude Florida's education system, compared to other states, produces students weak in basic skills, Florida does not have a sufficiently skilled workforce, and advanced science and engineering skills are limited.
- A more highly educated workforce attracts high-tech businesses, which translates into increased state revenues.
- Florida needs to implement policies to improve mathematic and scientific literacy and invest in human capital in order to better attract new knowledge-based industries and research institutions.

## Positioning Florida to Compete for High Tech Industries

Florida has had several successes in recent years in attracting hi-tech industries and research institutes, the Scripps Research Institute being one of the most recent. Nevertheless, Florida's efforts do not occur in a vacuum. Other states, as well as other countries, are aggressively positioning themselves to attract research facilities and industries that employ a skilled workforce.

For instance, according to the Milken Institute's State Technology and Science Index: *Enduring Lessons for the Intangible Economy*, Massachusetts ranks number one in technology and science. Florida, a state usually ranked 3 or 4 in many other categories, ranked 32 in 2004, down from 29 in 2002. (Ross DeVol and Rob Koepp, with Junghoon Ki, March 2004. <http://www.milkeninstitute.org>)

Other states are vigorously taking steps to attract new high tech industries through a variety of policy measures. It is clear that other states see a connection between a high quality education establishment and the development of new research arenas and industries. (See Nat. Assoc. of Seed and Venture Funds – NetNews website, [www.nasvf.org](http://www.nasvf.org), for examples.) States from Virginia to Washington are developing policies to promote economic development, very often with recognition that there must be an investment in preparing a high quality workforce, starting with the K-12 system.

According to the Milken Institute, Human Capital Capacity is a major criterion for state economic growth. "Today a state or region's most important source of economic advantage is the knowledge embedded in its people (intellectual capital)". This can be measured by a variety of factors including the percent of the adult population with bachelor's degrees, high school graduation rates, college completion rates, the number of degrees granted in science, mathematics and engineering by the state's universities, and the concentration of Ph.D. holders. States with high levels of Ph.D. degree holders are safely assumed to have quality research and development centers and a solid advanced education system. Bachelor's degrees are important to a state because it gives an indication of both the level of educational attainment and the types of skills that are demanded by the state's firms. The total number of and percentage of the population with advanced degrees or higher are important to a state because large concentrations of people with advanced degrees are a good indicator of a state labor pool's sophistication and level of skill development.

How does Florida compare with other states in these important factors and what trends do we see? According to *Measuring Up*, the National Center for Public Policy and Higher Education's 2004 State Report Card on Higher Education, Florida has kept pace with national increases in the percent of residents with a bachelor's degree over the past decade. However, compared with other states, only a fair proportion of residents (27% in 2004) have a bachelor's degree, compared with 36% in the top states, and this substantially weakens the state economy.

Florida is one of the lowest performing states in the percentage of young adults with a high school diploma. The state's 8<sup>th</sup> graders, particularly from low-income families, perform poorly

on national assessments in math. Students from the 8<sup>th</sup> to 12<sup>th</sup> grades are not taking the upper-level math courses they need to succeed in rigorous college courses. Also over the past decade, Florida has had the steepest decline of all states in the percentage of high school students enrolling in upper level science. Compared with best-performing states, small percentages of Florida high school students are enrolled in upper-level math (38%) and science (26%), compared to 59% and 41% respectively for the top states. Compared with other states, the likelihood of 9<sup>th</sup> graders enrolling in college within four years is low primarily because the proportion of high school students graduating is among the lowest in the country. (<http://measuringup.highereducation.org>)

There are encouraging trends however, in that over the past decade, the gaps in college participation have narrowed between white and minority young adults. However, these gaps remain large, and have a magnified economic impact in a highly diverse state such as Florida. If all ethnic groups had the same educational attainment and earnings as whites, total personal income in Florida would be about \$15.3 billion higher, and the state would realize an estimated \$5.4 billion in additional tax revenues.

The Florida Chamber of Commerce Foundation in its *New Cornerstone: The Next Generation of Economic Leadership* (2001), lists four areas where Florida is at a competitive disadvantage in intellectual infrastructure. (<http://www.newcornerstoneonline.com>)

1. Basic education skills are weak. Only 69% of Florida's entering high school freshmen graduate four years later (FDOE, 2003). While great strides have been made in recent years, the graduation rate is up from 56% in 1997, this still leaves Florida at a disadvantage compared to most states.
2. Skilled labor is in short supply in many industries. Business leaders across a range of industries – health-care to information technology – express concerns about the availability of skilled workers to support future expansion. This is a particular concern for Florida, which traditionally has relied upon in-migration from other states to replenish its workforce. As other states aggressively pursue knowledge-based industry development, Florida may find itself at a greater disadvantage.
3. Advanced science and engineering skills remain limited. The size and scope of science and engineering education in Florida lags those of other states.
4. Technology discovery, development, and deployment remain unbalanced. Florida has made great strides in strengthening its technology infrastructure through the work of leading universities and public/private partnerships such as Florida's High Technology Corridor Council. However, Florida, with 4% of the U.S. population, accounts for just over 2% of the research and development by universities and private industry, according to the National Science Foundation.

As emphasized in the proposal to the National Science Foundation to convene a statewide mathematics and science summit, Florida does not produce a sufficient number of appropriately prepared graduates at any level; too few of the state's high school or college graduates have a fundamental understanding of science or mathematics skills adequate for technology-related employment; Florida is not graduating enough science and technology specialists from our two and four year colleges; and it does not produce enough U.S. citizens and permanent residents that hold Ph.D.'s in the needed fields.

Each dollar invested in adequately preparing Florida students to become scientifically literate and mathematically proficient is returned in the form of increased tax revenues from high technology industries that locate or remain in Florida and from citizens with incomes commensurate with their skills and training. Human capital – cultivated human potential – results from investments made by the public, by parents, by employers, and by the individuals themselves. We must invest more in human capital in this state. Floridians must recognize that improved mathematics and science teaching and learning are necessary if we are not to fall behind other states that are making significant strides in economic development.

**Prepared for the 2005 Florida Summit on Mathematics & Science Education**

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