NOTES FOR GEORGIA TECH PRESIDENT G. WAYNE CLOUGH
Commerce Dept Competitiveness Summit, September 18, 2007

Opening question:
“You have made tremendous gains since becoming Georgia Techs 10th president in September 1994. U.S. News & World Report has ranked the Institute as one of the nation’s top 10 public universities for eight consecutive years, and a number of the institutions programs rank among the very best. Your strategy has been to focus on making sure Georgia Techs graduates are prepared to compete in today’s growing global economy. Can you talk a little bit about how you see the global economy changing the role of colleges and universities today?”

• Emerging global economy based on innovation calls for universities to come down out of the “ivory tower” and assume a new role in helping to drive innovation and educate the workforce:
  o Nimble and flexible
  o Collaborative across disciplines and with partners in higher education, industry, and government – places where these linkages work well are often where “hot spots” of innovation emerge.
  o Global in perspective and partnerships with other universities that position the U.S. to leverage discoveries and innovations that take place in other places, just as others have leveraged and will leverage our discoveries and innovations.
  o Better at connecting what is happening in their research labs with what is happening in the marketplace – tech transfer, commercialization
  o Graduates who are prepared to work at the highest levels of the global workforce, which is where America needs to compete if it is going to maintain its standard of living.

• The attributes universities need to instill in graduates to give corporate America the high-level workforce it needs:
  o Communication and teamwork skills
  o Citizen of the world, comfortable with diversity and other cultures
  o Understands technology
  o Knows how to frame the important questions as well as how to solve open-ended problems
  o Can think creatively, dynamically, rather than just apply formulae
  o Has an environmental sustainability perspective
  o Is prepared for leadership

• Characteristics of education programs (use GT examples):
  o Undergraduate research
  o Study abroad
  o Internships, co-op program
  o Opportunities for creativity
  o Leadership opportunities
  o 24/7 view of college experience – not just time spent in the classroom
Follow-up questions:

1. America's science and technology workforce is composed largely of aging white males. How can universities help to encourage more women and minorities to seek education and pursue careers in science and technology?

2. To be competitive at the highest end of the global economy, the United States needs a highly skilled and educated workforce. Yet higher education is being criticized for high costs, which limit access to a college education. How are Georgia Tech and other universities addressing the issue of accessibility?

3. The hands-on labwork and practicum work of the curriculum make it difficult for science and engineering students to study abroad, and the American Council on Education reports that less than one percent of the nation's engineering majors go abroad. Georgia Tech is an exception to this rule – you have the nation's largest engineering school, yet more than a third of your students study abroad. How do you manage it?

DATA POINTS

*Competitiveness Index: Where America Stands* (Council on Competitiveness)

- The U.S. invests more per student on primary and secondary education than any other nation except Switzerland, but many students leave high school unprepared for post-secondary education or many kinds of employment. Almost two decades after the hallmark report *A Nation at Risk*, progress has been limited.
- Report by American College Testing Program (ACT) found only half of 2005 high school graduates had the reading skills they needed to succeed in college.
- Higher income, lower unemployment rates correlate positively with college education.
- The highest-paying and fastest-growing jobs of the future will require at least some college.
- If you look at people ages 55-64, America leads the world with 86% of this age cohort having earned a high school diploma. By comparison, in South Korea, for example, only 34% of this age cohort has a high school diploma. But if you look at people ages 25-34, 87% of Americans have a high school diploma compared to 97% of South Koreans.
- Making the same comparison for college degrees: 36% of Americans aged 55-64 hold college degrees compared to only 10% of South Koreans. But in the 25-34 age cohort, only 39% of Americans hold college degrees compared to nearly 50% of South Koreans.
- In 9 other nations, a larger percentage of the 25-34 age cohort holds college degrees than in the United States.
• The moving of the Baby Boomers through the pipeline gives the U.S a higher proportion of older workers and retirees at the very time that younger, better-educated workers are coming along in other nations.

• In 1950, 80% of American jobs were classified “unskilled.” Today about 85% of American jobs are classified as “skilled” (meaning they require education or training beyond high school).

• The nature of skilled work has also changed – requiring growing use of IT, critical thinking and problem-solving skills rather than just applying rules and formulae. These skills are harder to teach than the memorization of rules and formulae.

_Trends in America_ (Council of State Governments)

• From 1999 to 2005, the growth rate for professional and technical jobs in the U.S. outpaced that of overall employment by nearly 68%.

• In an assessment of 15-year-olds in 40 countries, the U.S. ranked behind 9 other countries in reading and behind 23 other countries in math. (From OECD’s _Education at a Glance_, 2006)

_Trends in Student Aid 2006_ (College Board)

• Federal loans make up about half of total student aid. The second-largest chunk (24.5%) is in the form of grants provided by colleges and universities themselves. Pell Grants are third (9%).

• During the 2005-06 academic year, about $135 billion in financial aid was distributed to undergraduate and graduate students in the form of grants, loans, work-study, and federal tax credits or deductions. In addition, students borrowed about $17 billion in private, nonfederal loans.

• Even after adjusting for inflation, total aid to undergraduate and graduate students increased by almost 95% between the 1995-96 academic year and the 2005-06 year.
  o Grant aid increased by 46%, but that only covered 26% of the increase in average private tuition and fees and 74% of the increase in average public tuition and fees.

• Grant aid awarded by colleges from their own sources increased by $11 billion during this decade, from $13.4 billion to $24.4 billion.

• Aid from the federal government
  o Federal grant aid comprises only 31% of the nation’s post-secondary student grants. 41% comes from colleges and universities themselves (GT Promise, e.g.) and the rest is from state government and private sources.
  o Pell Grant expenditures declined from $13.6 billion in 2004-05 to $12.7 billion in 2005-06. The number of recipients increased by 3 percent in 2004-05 and 1.5% in 2005-06.
  o The average Pell Grant (per recipient) fell by $120 from $2,474 to $2,354 between 2004-05 and 2005-06.
  o The average Pell Grant covered 42% of tuition room and board at the average public college in 2001-02, but only 33% in 2005-06.
  o Federal tax credits and tuition deductions now constitute about 6% of total federal student aid.
  o In 2004, 6.5 million taxpayers claimed about $3.8 billion in deductions for interest paid on student loans.
Over the decade from the 1995-96 academic year to the 2005-06 academic year, subsidized federal student loans declined from 29% to 19% of the funds students used to finance their college education.

- Median debt levels of graduating students increased sharply between 1995-96 and 1999-00, then leveled off.

*Science & Engineering Indicators 2006*

- In 1983, 35% of entering freshmen across the nation said they intended to major in science or engineering. In 2004, that number was 33%. 11.5% said they intended to major in engineering in 1983 compared to 9.6% in 2004.
  - Of women in the entering freshman class, 3.8% said they intended to major in engineering in 1983 compared to 2.9% in 2004.
  - Of African Americans in the entering freshman class, 8.8% said they wanted to major in engineering in 1983 compared to 7.7% in 2004.
  - Of Hispanics in the entering freshman class, 12.3% said they wanted to major in engineering in 1983 compared to 10.8% in 2004.
- Undergraduate engineering enrollments nationwide declined through the 1980s and 90s from a 1983 peak of 441,000 to a low in 1999 of 361,000, then recovered to 422,000 by 2003.
- Women earned 21% of bachelor’s degrees in engineering, 27% in computer science, 43% in physical science. Enrollments in 2003 were 22% in engineering and 28% in computer science.
- Under-represented minorities (African Americans, Hispanics, native Americans) comprised about 6% of graduate enrollment in engineering in 2003 – up from 3.3% in 1983.
- 29% of the college-educated science and engineering workforce is over age 50.
- 25% of the college-educated science and engineering workforce is foreign-born.
- 40% of those in the science and engineering workforce who hold doctorates is foreign-born.
- Women in the science and engineering workforce increased from 12% in 1980 to 25% by 2000. However the bulk of that increase was during the 1980s. They only increased by 3% from 1990-2000.
- African Americans in the science and engineering workforce increase from 2.6% in 1980 to 6.9% in 2000. Hispanics increased from 2.0% to 3.2% 1980-2000.

*American Council on Education (ACE) poll, late 2006*

- 70% of Americans believe that math and science skills will be very important to all college graduates in the 21st century, but only 54% say colleges and universities should require students to take more math and science courses.
- 85% favor a program of scholarships for students majoring in math and science.
- As to why students don’t take more math and science, 44% believe it is because students think such courses are too hard; 33% believe it is because the material is not interesting or presented in an engaging way.
Georgia Tech
- No. 7 among public universities. More than a third of our students study abroad.
- More than 40% are engaged in structured research.
- GT is one of the nation’s top 15 values in education (Kiplinger)
- No. 1 producer of African-American and female engineers. Ranked as one of top 5 American universities for Hispanic engineering students.
- Close to 1,000 of our undergraduates go abroad during the course of any given year for study or work.
- Interdisciplinary facilities: gather faculty and students from several disciplines around major questions or topics.
- GT Promise: more minority students than our student body as a whole (40% white, almost 20% African American, 6% Hispanic, 33% Asian American).
- Paul Simon Internationalization Award for growing international focus and opportunities for students.
- In the Cooperative Education Hall of Honor as nation’s fourth oldest and largest voluntary program.
- Co-op/intern programs and international study opportunities recognized by U.S. News.