All I Really Need to Know In College I Learned in K–12

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CT State Dept. of Education
Presentation to CT Assessment Forum
Aug 13, 2012
Definitions of College Readiness

- Traditional – Focus on the student
  - Data-driven: “Looking under the streetlight.”
    - SAT, ACT, NESSC, SFSF measures of college readiness.
    - Test scores, rigor, GPA
  - Theory-driven: “Immeasurably good.”
    - Conley’s Qualitative Aspects of Readiness
Definitions of College Readiness: SAT

The score associated with a 65 percent probability of obtaining a B– in first-year college courses.

CR threshold:
- SAT benchmark 1550
- HS GPA benchmark 3.33 or a B+
- Academic Rigor Index of 10
SAT Results: Percent College Ready

2011 College-Bound Seniors
College Readiness – All Test-Takers

43% of SAT® takers achieved the SAT® College and Career Readiness Benchmark, indicating a high likelihood of succeeding in college.

- Achieved SAT College and Career Readiness Benchmark
- Did Not Achieve SAT College and Career Readiness Benchmark

Source: College Board News Release, Sept. 4, 2011
### SAT Results: Percent of CT Public School Students Meeting Benchmark

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Pct Met or Surpassed SAT Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Indian</td>
<td>37%</td>
</tr>
<tr>
<td>Asian American</td>
<td>58%</td>
</tr>
<tr>
<td>Black</td>
<td>11%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>20%</td>
</tr>
<tr>
<td>White</td>
<td>55%</td>
</tr>
<tr>
<td>Other</td>
<td>36%</td>
</tr>
<tr>
<td><strong>ALL Public CT Students</strong></td>
<td><strong>45%</strong></td>
</tr>
</tbody>
</table>

Source: College Board and CSDE calculations
# PSAT to SAT Benchmark

Percentage of 2009 PSAT/NMST Test-takers Who Met or Surpassed SAT Benchmark Scores

<table>
<thead>
<tr>
<th>Grade</th>
<th>Critical Reading</th>
<th>Math</th>
<th>Writing</th>
<th>PSAT Composite</th>
</tr>
</thead>
<tbody>
<tr>
<td>11th Grade</td>
<td>40%</td>
<td>44%</td>
<td>38%</td>
<td>36%</td>
</tr>
<tr>
<td>10th Grade</td>
<td>27%</td>
<td>35%</td>
<td>26%</td>
<td>27%</td>
</tr>
</tbody>
</table>

Source: College Board, Research Report No. 2010-4, PSAT/NMSQT® Indicators of College Readiness
Empirically derived—based on the performance of students in college
Readiness Benchmark is the minimum score needed on an ACT subject-area test
to indicate a 50% chance of obtaining a B or higher or about a 75% chance of obtaining a C or higher in the corresponding first-year credit-bearing college course.
- English Composition, College Algebra, an introductory social science course (e.g., History, Psychology, Sociology, Political Science, and Economics), and Biology.
ACT Results: Percent College Ready

Source: ACT, Inc., The Condition Of College Readiness 2009
Conley’s College and Career Readiness

- “the level of preparation a student needs in order to enroll and succeed—without remediation—in a credit-bearing course at a postsecondary institution that offers a baccalaureate degree or transfer to a baccalaureate program, or in a high-quality certificate program that enables students to enter a career pathway with potential future advancement.”

What is does “succeed” mean?

- Success is defined as “completing the entry-level courses or core certificate courses at a level of understanding and proficiency that makes it possible for the student to consider taking the next course in the sequence or the next level of course in the subject area or of completing the certificate.”

Conley’s four-part conceptual model of college readiness:

- **“Habits of mind”** or intentional behaviors students must be able to employ over time and in a variety of situations:
  - problem formulation, research, interpretation, communication, and precision and accuracy.

- **Mastery of key content knowledge** is achieved by “processing information and applying that information by means of the key cognitive strategies”:
  - writing and core academic subject knowledge and skills such as math, science, the sciences, world languages, and the arts.

- **Academic behaviors (or self-management)**: self-awareness, self-monitoring and self-control of a variety of “processes and behaviors necessary for academic success”:
  - reflection, commitment to continuous improvement, and study skills.

- **Contextual skills and awareness (or “college knowledge”)** incorporate the “privileged information necessary to understand how college operates as a system and a culture”:
  - understanding the relationship between the students’ “cultural frame of reference” and the culture of the college; the ability to collaborate; being comfortable around people from diverse backgrounds; awareness of college culture in order to gain admission to and navigate the postsecondary system.

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We are left to Measure Mastery of Content, or the traditional method

- Mastery of key content knowledge
  - writing and core academic subject knowledge and skills such as math, science, the sciences, world languages, and the arts.
  - SAT, ACT, AP, GPA, CAPT, PSAT, etc.
Ready or not, here I come

After explaining to a student through various lessons and examples that:

\[ \lim_{x \to 8} \frac{1}{x-8} = \infty \]

I tried to check if she really understood that, so I gave her a different example. This was the result:

\[ \lim_{x \to 5} \frac{1}{x-5} = 5 \]
What would Comprehensive Model of College Readiness look like?

- Focus on the incentives and constraints of all decision-makers:
  - Elementary/Secondary Schools:
  - Students:
  - Parents:
  - Colleges:
What percent of students complete courses at a level of understanding and proficiency that makes it possible for the student to consider taking the next course in the sequence or the next level of course in the subject area?
Grade 5 CMT Scores

Source: CT State Dept. of Education
Grade 8 CMT Scores

Source: CT State Dept. of Education
Grade 10 CAPT Scores

Source: CT State Dept. of Education
## NAEP Grade 8 Scores

<table>
<thead>
<tr>
<th></th>
<th>Year</th>
<th>Average Scale Score</th>
<th>Percent of Students At/Above Proficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connecticut</td>
<td>2009</td>
<td>155</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>2011</td>
<td>155</td>
<td>35</td>
</tr>
<tr>
<td>National Public</td>
<td>2009</td>
<td>149*</td>
<td>29*</td>
</tr>
<tr>
<td></td>
<td>2011</td>
<td>151*</td>
<td>31*</td>
</tr>
</tbody>
</table>

*indicates a statistically significant difference when compared to Connecticut performance.

Sources: Alliance for Excellent Education, CT State Dept. of Education and NAEP
A Note about the Achievement Gap in CT

<table>
<thead>
<tr>
<th>State</th>
<th>Gini index</th>
<th>P90/10 index</th>
<th>P95/20 index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Value</td>
<td>Standard error</td>
<td>Value</td>
</tr>
<tr>
<td>Higher than United States on all three measures of income inequality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>District of Columbia</td>
<td>0.540</td>
<td>0.0033</td>
<td>21.987</td>
</tr>
<tr>
<td>New York</td>
<td>0.499</td>
<td>0.0007</td>
<td>12.507</td>
</tr>
<tr>
<td>Connecticut</td>
<td>0.481</td>
<td>0.0015</td>
<td>11.571</td>
</tr>
<tr>
<td>Louisiana</td>
<td>0.477</td>
<td>0.0017</td>
<td>12.653</td>
</tr>
<tr>
<td>Mississippi</td>
<td>0.474</td>
<td>0.0018</td>
<td>12.423</td>
</tr>
<tr>
<td>Texas</td>
<td>0.474</td>
<td>0.0013</td>
<td>11.491</td>
</tr>
<tr>
<td>Alabama</td>
<td>0.469</td>
<td>0.0012</td>
<td>11.871</td>
</tr>
<tr>
<td>California</td>
<td>0.469</td>
<td>0.0012</td>
<td>11.400</td>
</tr>
</tbody>
</table>

Low-income: less than $40,000
High-income: greater than $100,000.
The difference between the two means is 330 points.

Source: College Board and CSDE calculations
Students as decision-makers
The Calculus of College – Human Capital Decision

“If you could do college-level math, you might not choose to go to college.” – Anon

• Compare the costs and benefits of college:

• Costs of attending college
  – Direct costs: tuition, fees, and books.
  – Indirect cost: forgone earnings while attending college.
Demand for education has risen historically

Percent of U.S. Population (25 and over) with a High School, College Degree: 1910 to 2010

Source: National Center for Education Statistics
The HH curve is the age-earnings profile if a person does not attend college.

The CC curve is the cost-earnings profile if one attends college.

The total cost of attending college is the sum of the direct costs (area 1) plus indirect costs (area 2).

The benefit of attending college is the increase in earnings due to the college degree (area 3).

Whether it is rational to attend college depends on whether the present value of the benefits (3) exceeds the present value of the costs (1+2).
Age–Earnings Profiles, by Education

Mean Earnings by Age and Highest Degree Earned: 2009

Generalizations

- Length of income stream
  - The longer the stream of positive incremental earnings, the more likely the net present value will be positive.
    - As a result, younger people are more likely to attend college

- Costs of attending college
  - The lower the cost of attending college, the more likely the net present value is positive.
    - Older people have a higher opportunity cost of attending college, less likely to attend.
Earnings differential

- The larger the college–high school earnings differential is, the more likely the net present value is greater.
  - College attendance rose in the 1980s as the college–high school premium increased.

The Discount Rate

- The larger the Discount Rate (interest rate), the smaller present value of future earnings, so higher interest rates decrease college attendance
The Benefits of a College Education

Cumulative Earnings by Education Level and Age: 2010

Source: The College Board, Education Pays 2010
The Benefits of a College Education

Median Earnings for Full-Time, Year-Round Workers Aged 25-64 by Educational Attainment (2010)

Source: U.S. Census Bureau, PINC-03, Table 28
http://www.census.gov/hhes/www/cpstable/032011/perinc/new03_028.htm
College–High School Wage Premium

Source: The College Board, Education Pays 2010
Caveats

- The college–high school wage premium reports *past* differentials.
  - The future differential may be smaller as the high differential may increase future supply.

- These are *average* earnings of college and high school graduates; the distribution of earnings around the mean is wide.

- The quality of schooling matters as well as the quantity of schooling.
The marginal rate of return to education declines as additional schooling is acquired.

The increases in knowledge decline with each additional year of schooling.

The return also falls because the explicit cost and opportunity cost of education rises with additional schooling.
Rates of Return to Schooling will differ because of:

- Innate ability differences between individuals
- Discrimination differences
- Access to and cost of funds differences

If the returns differ, then so will investment levels, generating income differences.
Al has low mental/physical talents and/or low motivation and self-discipline. His demand for schooling is $D_A$.

Bob has high mental/physical talents and/or high motivation and self-discipline. He has a greater demand for schooling at $D_B$ because he can better translate schooling into higher productivity and earnings.

For a given interest rate, Bob will obtain more schooling which will compound the earnings differential between low and high ability persons.
Albert is a minority and is discriminated against in the labor market. His demand for schooling is $D_A$ since he has low ability to convert additional schooling into higher earnings.

Brett is white and has a greater demand for schooling at $D_B$ as he can reap the benefits of additional schooling.

For a given interest rate, Brett will obtain more schooling which will compound the earnings differential between whites and minorities.
Access and Cost of Funds

- Ann is from a wealthy family and faces a low cost of borrowing funds ($i_A$). Her optimal level of schooling is $e_A$.

- Betty is from a poor family and faces a high cost of borrowing funds ($i_B$). Her optimal level of schooling is $e_B$. 

\[ D_A = D_B \]
College = human capital accumulation?

Time use on an average weekday for full-time university and college students

- Traveling (1.5 hours)
- Other (2.2 hours)
- Grooming (0.8 hour)
- Eating and drinking (1.1 hour)
- Educational activities (3.4 hours)
- Working and related activities (3.0 hours)
- Leisure and sports (3.6 hours)
- Sleeping (8.4 hours)

Total = 24.0 hours

NOTE: Data include individuals, ages 15 to 49, who were enrolled full time at a university or college. Data include non-holiday weekdays and are averages for 2006-10.

Are Parents Ready?
Percent of Families with a Plan for Financing College

Source: How America Pays for College 2012: Sallie Mae’s National Study of College Students and Parents, Conducted by Ipsos Public Affairs
More College Students, More Degrees, Flat HS Grads

College Enrollment, Bachelor's Degrees Conferred, and High School Graduates, Actual and Projected: 1995-2020

Growth in non-traditional, minority college enrollees

The cost of college has rise by 429 percent during the last two decades, a rate that’s even higher than the rate for health care. To cover these costs students have borrowed ever-larger amounts resulting in an average debt at graduation now exceeding $27,000. Yet only 50 percent of students pursuing a bachelor’s degree—and 21 percent of those pursuing an associate’s degree—complete their college programs.
# Are colleges ready to graduate their students?

<table>
<thead>
<tr>
<th>College Name</th>
<th>Six-Year Graduation Rate (%)</th>
<th>Annual Tuition and Fees ($)</th>
<th>Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitchell College</td>
<td>36</td>
<td>23,093</td>
<td>807</td>
</tr>
<tr>
<td>Post University</td>
<td>36</td>
<td>22,550</td>
<td>935</td>
</tr>
<tr>
<td>University of New Haven</td>
<td>36</td>
<td>26,396</td>
<td>4,029</td>
</tr>
<tr>
<td>Southern Connecticut State University</td>
<td>38</td>
<td>6,623</td>
<td>9,495</td>
</tr>
<tr>
<td>Western Connecticut State University</td>
<td>38</td>
<td>6,624</td>
<td>5,150</td>
</tr>
<tr>
<td>University of Bridgeport</td>
<td>43</td>
<td>22,860</td>
<td>3,734</td>
</tr>
<tr>
<td>Central Connecticut State University</td>
<td>44</td>
<td>6,734</td>
<td>9,684</td>
</tr>
<tr>
<td>Eastern Connecticut State University</td>
<td>48</td>
<td>6,961</td>
<td>4,474</td>
</tr>
<tr>
<td>University of Hartford</td>
<td>54</td>
<td>26,996</td>
<td>6,091</td>
</tr>
<tr>
<td>Saint Joseph College</td>
<td>55</td>
<td>24,690</td>
<td>1,218</td>
</tr>
<tr>
<td>Albertus Magnus College</td>
<td>57</td>
<td>21,114</td>
<td>1,917</td>
</tr>
<tr>
<td>Sacred Heart University</td>
<td>66</td>
<td>27,150</td>
<td>4,714</td>
</tr>
<tr>
<td>Quinnipiac University</td>
<td>72</td>
<td>28,720</td>
<td>6,651</td>
</tr>
<tr>
<td>University of Connecticut</td>
<td>74</td>
<td>8,852</td>
<td>21,373</td>
</tr>
<tr>
<td>Connecticut College</td>
<td>81</td>
<td>N/A</td>
<td>1,833</td>
</tr>
<tr>
<td>Fairfield University</td>
<td>81</td>
<td>33,905</td>
<td>4,223</td>
</tr>
<tr>
<td>United States Coast Guard Academy</td>
<td>81</td>
<td>3,000</td>
<td>963</td>
</tr>
<tr>
<td>Trinity College</td>
<td>87</td>
<td>36,870</td>
<td>2,312</td>
</tr>
<tr>
<td>Wesleyan University</td>
<td>92</td>
<td>36,806</td>
<td>3,079</td>
</tr>
<tr>
<td>Yale University</td>
<td>96</td>
<td>34,530</td>
<td>11,345</td>
</tr>
<tr>
<td>CT State Average</td>
<td>60.8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: DIPLOMAS AND DROPOUTS: Which Colleges Actually Graduate Their Students (and Which Don’t), Frederick M. Hess, Mark Schneider, Kevin Carey, and Andrew P. Kelly, American Enterprise Institute: June 2009

Note: The Beginning Postsecondary Students Longitudinal Study: 1996–2001, conducted by NCES, shows that many students switch institutions and then graduate, often taking longer than the six–year cutoff. This survey suggests that the “individual graduation rate” is about 8 percent higher than the average institutional graduation rate.
How have colleges responded to the need for remediation?

- **Adjunct faculty vs. full-time faculty teaching remedial courses:**
  - A national study of 45 two-year institutions reports that only 21% of developmental courses were taught by full-time faculty, but noted that this is an increase of 4% from data reported 10 years earlier in a similar study (Gerlaugh, Thompson, Boylan, & Davis, 2007).
  - Shults (2002) reported a 33 percentage of full-time faculty taught remedial courses in two-year institutions.
  - Only 20 percent of institutions reported required full-time faculty to possess specific training for developmental education before teaching remedial courses (Shults, 2000).
Progress of the Class of 2003

Class of 2003 Postsecondary Enrollment and Progress

Source: National Student Clearinghouse Student Tracker
How well do new college grads fare?

Source: Andrew Sum, Northeastern University, using 2009 American Community Survey data
How well do new college grads fare?

Source: Andrew Sum, Northeastern University, using 2009 American Community Survey data
How well do new college grads fare?

If we had a normal match between the skills workers possess and the skills employers require, the U.S. unemployment rate would be 6.5 percent instead of 9.6 percent.¹

40 percent of college graduates available to employers do not have the necessary applied skills required to meet their needs. ²

Almost one-third of U.S. manufacturing companies say they are suffering from some level of skills shortages. ²

Over 30 percent of American college graduates between the ages of 25 and 29 are currently working in low-skilled jobs. ²


Questions?