Promoting Excellence and Shrinking Excellence Gaps

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Victoria Fellows
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A little background
Quick Quiz!

- How many people worked as smartphone designers in 2007?
- Practically none, and they were all locked in Steve Jobs’ basement.
Quick Quiz!

• What percent of 85 year-olds live in nursing homes and similar facilities?
  • 11% as of 2014, down from 24% in 1990.
Quick Quiz!

• What percentage of the cells in your body are human?
  • Roughly half
Task requirements change; generally service jobs: hair stylist, home healthcare aide.

What's a dark factory?

Sources: US Population Survey; Federal Reserve Bank of St. Louis.
Who Gets U.S. Patents?

Utility Patent Grants, Foreign Origin
So other than family structure, the workforce, communication, the national and global economy, sources of innovation, and the coming robot apocalypse ...

... nothing has changed.
The 21\textsuperscript{st} Century ...

- ... is clearly proving to be a brave new world where skills and talents that previously helped us achieve success need to be rethought.

- Part of that is rethinking where talent comes from.
A little data
Percent of Advanced Scores (625+) on TIMSS Math Assessments
Percent of Advanced Scores (625+) on TIMSS Science Assessments

Grade 4

Grade 8

CHINESE TAIPEI
ENGLAND
HONG KONG
JAPAN
KOREA, REP. OF
RUSSIAN FEDERATION
UNITED STATES

U.S.
Percent of Students Scoring Advanced on NAEP Grade 4 Math
Percent of Students Scoring Advanced on NAEP Grade 8 Math
Percent of Students Scoring Advanced NAEP Grade 4 Reading
Percent of Students Scoring Advanced NAEP Grade 8 Reading
How Many Students Are Performing Above Grade-Level?

From research by Matt Makel, Michael Matthews, Scott Peters, Karen Rambo-Hernandez, and Jonathan Plucker
Too difficult

Readiness

Boredom

Challenge

Green = Development

Red = Limited to No Development

Vygotsky's Zone of Proximal Development
### TABLE 4

*Mastery Rates and Proficiency Probability Scores for Analytic Sample and Corresponding Descriptive Statistics for Teacher-Reported Content Measures*

<table>
<thead>
<tr>
<th>Student math proficiency levels</th>
<th>Students who have mastered level by fall kindergarten</th>
<th>Proficiency probability scores</th>
<th>Content measures</th>
<th>Teacher reported days/month on content measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proficiency level 1</td>
<td>95%</td>
<td>Mean 0.94, SD 0.15</td>
<td>Basic counting and shapes</td>
<td></td>
</tr>
<tr>
<td>Proficiency level 2</td>
<td>62%</td>
<td>Mean 0.58, SD 0.34</td>
<td>Patterns and measurement</td>
<td></td>
</tr>
<tr>
<td>Proficiency level 3</td>
<td>25%</td>
<td>Mean 0.23, SD 0.31</td>
<td>Place value and currency</td>
<td></td>
</tr>
<tr>
<td>Proficiency level 4</td>
<td>7%</td>
<td>Mean 0.04, SD 0.13</td>
<td>Addition and subtraction</td>
<td></td>
</tr>
</tbody>
</table>

*Note. Student n = 11,517; teacher n = 2,176.*

Teachers spend 12.7 days per month on material that 95% of K students already have mastered by Fall of Kindergarten.

<table>
<thead>
<tr>
<th>Grade</th>
<th>ELA</th>
<th>Math</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WI</td>
<td>CA</td>
</tr>
<tr>
<td>3</td>
<td>34%</td>
<td>23%</td>
</tr>
<tr>
<td>4</td>
<td>39%</td>
<td>29%</td>
</tr>
<tr>
<td>5</td>
<td>44%</td>
<td>34%</td>
</tr>
<tr>
<td>6</td>
<td>49%</td>
<td>34%</td>
</tr>
<tr>
<td>7</td>
<td>47%</td>
<td>38%</td>
</tr>
</tbody>
</table>
“...students performing above grade-level are not rare and likely exist in every classroom in every school”

16% of the variance falls between schools – almost all of the diversity comes from the classroom level!
Results Summary

1. Very large percentages of students are performing above grade level.
2. Large percentages of students are performing well above grade level.
3. These percentages represent staggeringly large numbers of students.

More than 300,000 4th grade students demonstrate above grade-level performance in only these three states.
Results Summary

1. Very large percentages of students are performing above grade level.
2. Large percentages of students are performing *well* above grade level.
3. These percentages represent staggeringly large numbers of students.

If only 20%-25% of students were scoring above grade level, that would represent 10-12 million students in the US.
Professor Andrew Ho, Harvard University expert on student measurement described our findings as:

“Obviousness”

“...students performing above grade-level are not rare and likely exist in every classroom in every school, and furthermore in numbers large enough to permit an accelerated classroom of these learners in every school”
Two Takeaways:

• Classrooms where large percentages of students already are above grade-level, but nearly all of the teacher’s focus is on learners working at or below grade-level, are not going to facilitate growth or further development for advanced learners.

• There is little support for the current age-based classroom structure as the optimal organizational structure for fostering student development.
### Table 2. Range of Grade Level Equivalent (GLE) Comprehension Scores on the ITBS for All Students Across Schools

<table>
<thead>
<tr>
<th>School</th>
<th>Grade 3</th>
<th></th>
<th></th>
<th>Grade 4</th>
<th></th>
<th></th>
<th>Grade 5</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Lowest</td>
<td>Highest</td>
<td>Range</td>
<td>N</td>
<td>Lowest</td>
<td>Highest</td>
<td>Range</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GLE score</td>
<td>GLE score</td>
<td>of GLE</td>
<td></td>
<td>GLE score</td>
<td>GLE score</td>
<td>of GLE</td>
<td></td>
</tr>
<tr>
<td>Sun Coast Elementary</td>
<td>117</td>
<td>0.6</td>
<td>8.3</td>
<td>7.7</td>
<td>59</td>
<td>3.9</td>
<td>10.0</td>
<td>6.1</td>
<td>35</td>
</tr>
<tr>
<td>North Lake Magnet</td>
<td>117</td>
<td>2.1</td>
<td>9.8</td>
<td>7.7</td>
<td>105</td>
<td>2.6</td>
<td>12.6</td>
<td>10.0</td>
<td>114</td>
</tr>
<tr>
<td>Frontier Elementary</td>
<td>75</td>
<td>0.9</td>
<td>7.5</td>
<td>6.6</td>
<td>68</td>
<td>1.6</td>
<td>11.1</td>
<td>9.5</td>
<td>74</td>
</tr>
<tr>
<td>Eastern River Elementary</td>
<td>70</td>
<td>1.3</td>
<td>8.3</td>
<td>7.0</td>
<td>74</td>
<td>1.7</td>
<td>11.1</td>
<td>9.4</td>
<td>83</td>
</tr>
<tr>
<td>Park Ridge Elementary</td>
<td>44</td>
<td>1.1</td>
<td>4.9</td>
<td>3.8</td>
<td>70</td>
<td>1.3</td>
<td>5.8</td>
<td>4.5</td>
<td>44</td>
</tr>
<tr>
<td>All</td>
<td>423</td>
<td>0.6</td>
<td>9.8</td>
<td>9.2</td>
<td>376</td>
<td>1.3</td>
<td>12.6</td>
<td>11.3</td>
<td>350</td>
</tr>
</tbody>
</table>

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**Reading Comprehension and Fluency Levels Ranges Across Diverse Classrooms: The Need for Differentiated Reading Instruction and Content**

Janine M. Firmender, Sally M. Reis and Sheelah M. Sweeney

*Gifted Child Quarterly* 2013 57: 3 originally published online 1 October 2012

DOI: 10.1177/0016986212460084
What level of academic diversity do you see in your schools and classrooms?
... well, they aren’t.

So when people say, “These kids will take care of themselves” ...
Excellence Gaps
Talent on the Sidelines Results

http://cepa.uconn.edu/mindthegap
NAEP % Advanced Math Grade 4

- NSLP
- non-NSLP

Percent Scoring Advanced

- 1996: 0.3
- 2000: 3.1
- 2003: 4
- 2005: 6
- 2007: 8
- 2009: 10
- 2011: 12
- 2013: 13

- Not bad
- Yikes

- 0.3
- 2
NAEP % Advanced Math Grade 4
... because math and reading look better.

But why not other subjects?
What’s “Advanced” in G4 Science?

• **262** Draw a conclusion about the relationship between volume and temperature based on data
• **262** Anticipate effects of a design decision based on the interdependence of organisms
• **229** Use evidence to critique a conclusion about the mass of a material
• **227** Explain how to produce sounds
• **225** Recognize the cycle of Moon phases
• **224** ADVANCED -------------------------------
• **218** Describe the different stages of the life cycle of an organism
• **217** Recognize fair test for determining how temperature affects a liquid
• **214** Predict the path of the Sun in the sky
2015 NAEP Science Overall Percent Advanced

Grade 4: 1.0
Grade 8: 1.9
Grade 12: 1.6
2015 NAEP Science Overall Percent Advanced

Grade 4
- M: 1.1
- F: 0.9

Grade 8
- M: 2.4
- F: 1.4

Grade 12
- M: 2.2
- F: 1.0
NAEP Science - Percent Scoring Advanced: NSLP, Black, Hispanic, American Indian, ELL

Grade 4 Grade 8 Grade 12

NSLP

Hispanic

0.5 0.6
2015 NAEP Science Percent Advanced

- **nonELL**
  - Grade 4: 1.1
  - Grade 8: 2.0
  - Grade 12: 2.0

- **Multiracial**
  - Grade 4: 1.4
  - Grade 8: 2.1
  - Grade 12: 3.2

- **Asian**
  - Grade 4: 1.3
  - Grade 8: 2.7
  - Grade 12: 4.3

- **White**
  - Grade 4: 1.3
  - Grade 8: 2.1
  - Grade 12: 2.7

- **nonNSLP**
  - Grade 4: 1.8
  - Grade 8: 2.3
  - Grade 12: 3.3
But What About Kentucky?
Kentucky 2015 NAEP Math

<table>
<thead>
<tr>
<th></th>
<th>NSLP</th>
<th>NON-NSLP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>9</td>
</tr>
</tbody>
</table>
Kentucky 2015 NAEP
Grade 4 Math

- Asian: 25
- White: 7
- Black: 1
- Hispanic: 4
Kentucky 2015 NAEP Grade 4 Reading

- **White**: 11
- **Black**: 4
- **Hispanic**: 3
- **N/A**:
Kentucky 2015 NAEP Science

- NSLP: 1
- NON-NSLP: 3
Kentucky 2015 NAEP Science

<table>
<thead>
<tr>
<th></th>
<th>NSLP</th>
<th>NON-NSLP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Value</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Value</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>
What evidence do you see of excellence gaps in your schools?
HOW DO EXCELLENCE GAPS CHANGE AS KIDS MOVE THROUGH SCHOOL?

Karen E. Rambo-Hernandez
West Virginia University
Scott J. Peters
University of Wisconsin- Whitewater
Jonathan A. Plucker
Johns Hopkins University

Manuscript under review, presented at NAGC 2017, Charlotte, NC
THE RESEARCH QUESTIONS

• What trends in excellence gaps exist in math and reading over the academic school year and over the summer?
• What school level variables explain initial differences and changes in the excellence gaps in mathematics during the school year and over the summer?
THE DEPENDENT VARIABLE

- The difference between the 90th percentile mean scores of non-underrepresented (White and Asian) and underrepresented minority students (Black and Hispanic)

  \[ \text{Difference} = \text{Score Non-URM}_{ti\_90th} - \text{Score URM}_{ti\_90th} \]
RESULTS: GAPS IN READING AND MATHEMATICS
RESULTS: ACHIEVEMENT IN READING OVER TIME
Results: Group and School Average Achievement - Math

<table>
<thead>
<tr>
<th>Grade</th>
<th>Summer</th>
<th>Fourth Grade</th>
<th>Summer</th>
<th>Fifth Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>URM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-URM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Results: Group and School Average Achievement - Math
CONCLUSIONS

• Reading gaps are relatively stable over the elementary grades
  – Pick up again in grade 5. Trend?
• Math gaps grow as kids move through school, specifically during the school year
IMPLICATIONS

• In reading, schools don’t appear to be causing the national trend in widening excellence gaps
  – Time in school, school-level poverty, demographics, etc. aren’t predictive of change in slope
  – The lack of change in gaps is inconsistent with prior research

• In mathematics, the widening of gaps was evident as students moved through elementary school
  – Consistent with prior research
IMPLICATIONS

Other possible explanations for discrepant results from our study and previous research in reading:

1. Other studies did not follow cohorts but looked at specific grades across time
2. Differences in initial intercept have been growing over time
3. Gaps only grow later in school (>5th grade)
   – Unlikely given prior findings by Plucker and colleagues (2010; 2013)
How do you think your schools impact excellence gaps?
Big Implication

We can predict with high accuracy that a talented student who is poor and/or Hispanic, Black, or Native American will not perform at advanced levels in K-12 education.

Hence “persistent talent underclass.”
What If We ...

... shrunk the low-income excellence gap in math from 13% to 6% in each grade?

EACH YEAR we would have 750,000 more students exhibiting academic excellence.
Some potential solutions
From book with Scott Peters:

- Realistic opportunities
- Universal testing and local norms
- Ability grouping
- Psychosocial interventions in college
- Better educator prep & support (teachers, admin, counselors)
- Improve K-12 accountability systems with adaptive testing

Published recently by Harvard Education Press
2010 Census Block Data
1 Dot = 1 Person

- White
- Black
- Asian
- Hispanic
- Other Race / Native American / Multi-racial

What am I looking at...?
Learn from the Mistakes of Chinese Marathon Runners

THE WALL STREET JOURNAL

CHINA REAL TIME REPORT

Thousands of Injuries, Mishaps at Chinese Marathon Prompt Alarm

Frontloading Matters!
• Gifted Child Today article on intervention model for excellence gaps available at:

go.uww.edu/peterss
Are you currently using any of these interventions? How well are they working?
What’s Your District’s Talent Development Plan?
2015 Report Card Study

Funded by the Jack Kent Cooke Foundation

Identified key excellence and excellence gap policies and outcomes

Determined how each state ranked on those policies and outcomes

New edition to be published in January
Kentucky Ratings

- Policies
  - Excellence: A-
  - Excellence Gaps: D

- Participation
  - Excellence: A
  - Excellence Gaps: C-

- Outcomes
  - Excellence: C+
  - Excellence Gaps: C

- Among the best 4-5 performing states in the U.S.
Strengths and Not-Strengths

**STRENGTHS**
- SEA reporting/monitoring
- Mandate
- Early K entrance
- State acceleration policy
- MS/HS concurrent enrollment
- Early college/dual enrollment
- Free ACT

**NOT STRENGTHS**
- Growth in accountability system
- Universal screening
- Gifted coursework in educator preparation programs
- Mixed funding for dual enrollment
Strengths and Not-Strengths

STRENGTHS
• % students taking AP tests
• % students identified for services

NOT STRENGTHS
• % low-income students taking AP tests
• State doesn’t report % identified students who are low-income
Big Take-Away of New Report:

- States and districts have a range of important excellence policies ... but they’re NOT connected.

- Key questions:
  - How does a talented young child move through your schools from K-12?
  - How would you describe the process/services to a parent of a talented child?
  - Do you include ALL of your excellence programs in your TD plan?
    - Gifted, honors, AP, acceleration, grouping, academic counseling, dual credit, aid for economically vulnerable families, etc.
  - Does your TD plan address transitions among grade levels? (Biggest parent concern)
JHU Gifted Education Programs

• Certification Program
  • Satisfied MD, PA, DE requirements
  • 6 courses
  • Do-able in 1 or 2 years
  • Can be combined with another JHU certificate to become a master’s degree.

• Master’s Degree Program
  • Includes certification courses
  • 11 courses
  • Do-able in 2 or 3 years

• Both programs will be blended by fall 2017, certification program online-only in 2018.
THANK YOU!

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