Making Practice Visible: The Emerging Scholars Program and IBL

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Numbers of Bachelors

Overall BAs

Sci & Eng

Math

The Emerging Scholars Program

100+ local adaptations

Berkeley
Texas
Wisconsin
Rutgers
Kentucky
Illinois

state colleges
liberal arts
two-year
African Americans and Latinos at UC Berkeley, 1970s

<table>
<thead>
<tr>
<th>Calculus 1</th>
<th>A’s and B’s per semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failure rate</td>
<td></td>
</tr>
<tr>
<td>~60%</td>
<td>~1</td>
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</tbody>
</table>

What theories did they put forward? (Take a guess.)
Theories of Failure, UC Berkeley 1970s

Motivation
Academic Preparation
Family Support
Income
Racial Inferiority

None the school’s fault.
Also, all wrong.
## Uri Treisman’s Ethnography (mid 1970s)

<table>
<thead>
<tr>
<th>African American</th>
<th>Chinese</th>
</tr>
</thead>
<tbody>
<tr>
<td>all HW on time</td>
<td>all HW on time</td>
</tr>
<tr>
<td>8 hrs/wk alone</td>
<td>8 hrs/wk alone</td>
</tr>
<tr>
<td>studied the book</td>
<td>studied the book</td>
</tr>
<tr>
<td>(as recommended)</td>
<td>+5 hrs/wk group study</td>
</tr>
</tbody>
</table>
Chinese Students...

...edited each other’s math
...edited each other’s English
...did old (killer) exams together
...discussed how long they studied
...shared efforts on difficult problems
...encouraged each other
...ate together

Students calibrated their effort and understanding using the visible practice of peers.
1. The IBL Workshop Core

Hard, non-rote Worksheets
Cooperative problem-solving
Visible struggle
Community building
2. Making the Core Possible

Honors, not remedial
Multi-racial recruitment
Lecture sections (GTA)
TA PD managing groups
Worksheet resources
  hard, non-rote, unfinishable, chestnuts, aerobics
Coordinator
3. Other Elaborations

UG Assistants
Worksheet web database
BetterFileCabinet.com
Big classes, big surfaces
Common Outcomes of Emerging Scholars Programs

- higher grades
- more calculus completion
- more calculus-based majors
  (even controlled for SAT)
Adapting ESP to SF State

1/2 Problem-driven group work
1/6 Individual (think, quiz)
1/3 Whole class (lecture, etc.)

standard syllabus
streaming lectures, online HW
(Play video.)
Some Further Reading

Hsu, Murphy and Treisman, “Thirty Years of ESP” in Making the Connection: Research and Teaching in Undergraduate Math (2009, MAA Notes)

Gandara, “Priming the Pump” (1999, College Board)

Rothstein, Class and Schools (2004)
More at my home page

math.sfsu.edu/hsu

THE END