Patching the STEM Pipeline: Lessons Learned in Higher Ed Post Pandemic

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Creating a Gracious Space

"Gracious Space creates a foundation for building a space of belonging for a diverse group of people to engage in deep listening and shared learning in time of complexity and change."

- Be open minded to new ideas and perspectives
- Everyone deserves to be heard – Listen before formulating a response
- Remain present and engaged
Icebreaker

Using the chat feature, tell us what trends have you been noticing at your institution among STEM students?
About Drexel Engineering

- Urban, world-renowned research institution located in Philadelphia, PA
- ABET accredited with over 3,500 enrolled students (undergraduate & graduate)
- 11 undergraduate engineering majors, including undeclared engineering
- Operates on quarterly calendar, 4 academic terms in year
- Co-op program which attracts career driven, goal-oriented students
- Calculus based math & science requirements
Impacts of COVID on Math & Science Pathways

• Impacts of COVID on national math & reading readiness show students were on average 5 months behind on math & 4 months behind on reading
  • These numbers increase based on race, income, & location
  • COVID has caused many universities to become SAT optional, including Drexel
• As a result, Drexel has seen a significant decrease in placement exam scores
  • This requires more students be placed in preparatory math & science courses
  • This also places students 1-2 academic terms behind in their engineering curriculum

Math Prep Courses:
- Elements of College Algebra or Calculus & Functions I & II

Science Prep Courses:
- Prep Physics for ENGR & Prep Chemistry

Traditional Starting Point:
- Calculus I, Physics I, Chemistry I
Global Issues with STEM Pipeline

- Not enough college graduates
- Rising costs of higher education
- K-12 inequities in preparatory resources & funding
- Specific lack of diversity for Women, BIPOC, Latin & Hispanic
- Lack of diverse STEM role models
Our Observations of the Issues

• More students placing into more preparatory courses
• Unsuccessfully completing STEM courses
• More handholding – Possibly from fear of making mistakes/unsure how to navigate nuances
• Using resources more than ever but still struggling
• Still unknown long-term impacts of COVID 19 on social and cognitive development
• Advisor frustration and burnout
Let’s Discuss…….

- How do you support students who test into lower prep courses?
- How does higher ed ensure that the STEM pipeline is diverse and inclusive? (pipeline includes college entry and persistence)
- How is your institution supporting students who aspire to earn a degree in STEM, but are not meeting requirements?
- How can Advisors continue to advocate for change and avoid burning out?
Let's Brainstorm Solutions!

Breakout Rooms

1. Identify reporter
2. Discuss three solutions that other advisors may be able to implement
3. Report back to the group
Thank you!

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References


- Drexel University College of Engineering, (2022). Retrieved from https://drexel.edu/engineering/about/overview/


Impact of COVID on Math & Reading

By the end of the 2020–21 school year, students were on average five months behind in math and four months behind in reading.

Cumulative months of unfinished learning due to the pandemic by type of school, grades 1 through 6

<table>
<thead>
<tr>
<th>Learning gap</th>
<th>By race</th>
<th>By income Household average, per school</th>
<th>By location School site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 5 months behind</td>
<td>Black 6</td>
<td>&lt;$25K 7</td>
<td>City 5</td>
</tr>
<tr>
<td></td>
<td>Hispanic 6</td>
<td>$25K–$75K 5</td>
<td>Suburb 5</td>
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<tr>
<td></td>
<td>White 4</td>
<td>&gt;$75K 4</td>
<td>Rural 4</td>
</tr>
<tr>
<td>Reading 4 months behind</td>
<td>Black 6</td>
<td>&lt;$25K 6</td>
<td>City 4</td>
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<tr>
<td></td>
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<td>Suburb 4</td>
</tr>
<tr>
<td></td>
<td>White 3</td>
<td>&gt;$75K 3</td>
<td>Rural 3</td>
</tr>
</tbody>
</table>

1Town or suburb.
Source: Curriculum Associates i-Ready assessment data

McKinsey & Company
### Black and Hispanic workers remain underrepresented in the STEM workforce

<table>
<thead>
<tr>
<th></th>
<th>All jobs</th>
<th>All STEM jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>11%</td>
<td>9%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>17%</td>
<td>8%</td>
</tr>
<tr>
<td>Asian</td>
<td>6%</td>
<td>13%</td>
</tr>
<tr>
<td>Other</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>White</td>
<td>63%</td>
<td>67%</td>
</tr>
</tbody>
</table>

**Notes:** Based on employed adults ages 25 and older. STEM stands for science, technology, engineering, and math occupations. Engineering includes architects. White, Black, and Asian adults include those who report being only one race and are not Hispanic. Hispanics are of any race. Other includes non-Hispanic American Indian or Alaskan native, non-Hispanic Native Hawaiian or Pacific Islander, and non-Hispanic two or more major racial groups.