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The National & State Context of STEM Education: Past, Present, and Future

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## An Ongoing National Challenge

<table>
<thead>
<tr>
<th>Year</th>
<th>Title</th>
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<tbody>
<tr>
<td>2012</td>
<td>Engage to Excel: Producing One Million College Graduates with Degrees in Science, Technology, Engineering and Mathematics</td>
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<td>2011</td>
<td>Complete College Georgia</td>
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<tr>
<td>2007</td>
<td>Rising Above the Gathering Storm</td>
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<td>2004</td>
<td>The Engineer of 2020: Visions of Engineering in the New Century</td>
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<td>2001</td>
<td>Federal No Child Left Behind Act</td>
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<td>1983</td>
<td>A Nation At Risk: The Imperative for Educational Reform</td>
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</table>
By 2020, it’s anticipated that 60% of jobs will require some form of higher education (certificate, associate’s, bachelor’s).

Currently, 42% of our young adults (age 25-34) qualify.

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**Complete College Georgia**

*Projected need, assuming current graduation levels are maintained, and population change is met.*
100 Georgia Public 9th Graders

56 Graduate High School

24 Start a 4-year College

19 Become Sophomores

6 Graduate Within Time

13 Start a 2-year College

6 Become Sophomores

3 Graduate Within Time

91% Loss
STEM Education is Critical

PCAST’s conclusion:

1,000,000 STEM graduates → 10 years

Currently, of all intended STEM majors:

40 percent → complete degree

Georgia’s commitment:

expanding access and success through innovative practices
Setting the Stage

- HOPE Scholarship (1993)
- Regents’ P-16 Initiative (1995)
- Regents’ Principles for the Preparation of Educators for the Schools (1998)
The University of Georgia

The diagram illustrates various initiatives and programs focused on education and STEM education.

1. Professional Learning
2. SM Specialists Elementary
3. Learning Communities
4. Institute Teaching & Learning-SM
5. Teacher Preparation GPS
6. Teacher Working Conditions
7. Teacher Recruitment
8. New K-12 Curriculum GPS
9. Public Awareness Campaign
10. HE Reward System

These initiatives are interconnected, emphasizing the importance of collaboration between the Education Faculty and SM Faculty to support K-12 Teachers.
8.3.15 Enhancing Teaching and Learning in K-12 Schools and USG Institutions

The BOR recognizes the value of USG faculty engagement in the effort to continuously improve teaching and learning in K-12 schools and USG institutions.

- **Work in K-12 Schools**
  USG institutions will *support and reward faculty who participate in significant and approved efforts to improve teaching and learning in K-12 schools, including teacher preparation*, through decisions in promotion and tenure, pre-tenure and post-tenure review, annual review and merit pay, workload, recognition, allocation of resources, and other rewards.

- **Work in USG Institutions**
  USG institutions will *support and reward faculty who participate in significant efforts to improve teaching and learning in USG institutions* through decisions in promotion and tenure, pre-tenure and post-tenure review, annual review and merit pay, workload, recognition, allocation of resources, and other rewards.
USG STEM Initiative I

• Launched by Chancellor as a Presidential Initiative (2007-2011)

• Three Goals:
  
  ➢ Increase the number of K-12 students interested in STEM
  
  ➢ Increase the number of students in college who pursue the STEM disciplines
  
  ➢ Increase the number of teachers prepared in science and mathematics

“Creating A More Educated Georgia”
Creating A More Educated Georgia

Strategy #1: HS Course Requirements
Strategy #2: Public Awareness Campaign
Strategy #3: Academy Future Teachers
Strategy #4: Replicate MESA
Strategy #5: Institute on Teaching and Learning of SM
Strategy #6: A, B, C rates in Intro Courses
Strategy #7: Mathematics Success
Strategy #8: STEM Production Targets
Strategy #9: Incentives for STEM Faculty
Strategy #10: STEM Majors in Teaching
Strategy #11: Culture Change “Work in the Schools”
Strategy #12: Set SM Teacher Production Targets

“Creating A More Educated Georgia”
Key Programs & Outcomes

❖ Academy of Future Teachers
  ❖ Attract talented HS students to teaching profession
  ❖ FY 2008 – FY 2010: 6 Institutions
  ❖ 334 High School students participated in AFT
Key Programs & Outcomes

- **Project MESA** (Mathematics Engineering Science Achievement)
  - Increase retention of underrepresented groups in STEM fields at 2-yr institutions
  - 95.8% increase in participation (119 to 233)
  - Increased retention rate
  - Increase in the number of students transferring to 4-yr institution

“Creating A More Educated Georgia”
Key Programs & Outcomes

- Structured Mini-Grant Program
  - Faculty collaboration in K-16 Learning Communities & SoTL activities
  - Work to increase success and retention in introductory STEM courses
  - FY 2009- 80 Mini-grants funded
  - FY 2010- 57 Mini-grants funded