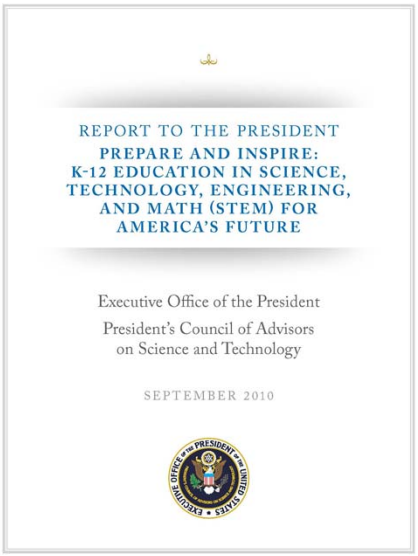
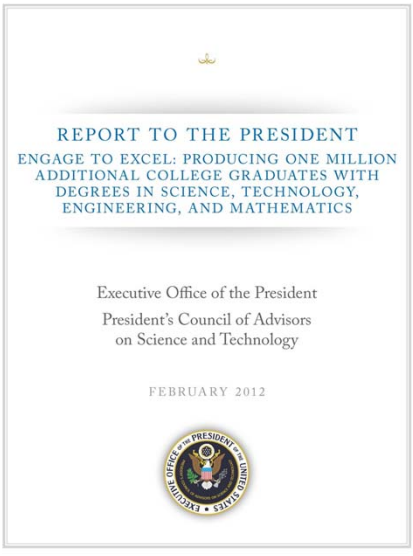
# President's Council of Advisors on Science and Technology

Education Information Technology (EdIT):
Multi-phase study

November 2013

## Previous PCAST Reports on STEM Education



## PCAST Project on EdIT: Role of technology in…

- Higher education
  - Massive Open Online Courses (MOOCs)
- Workforce training/reskilling; adult education
- K-12 education

## Phase I: MOOCs letter report

Can emerging education technologies improve outcomes/lower costs in higher education?

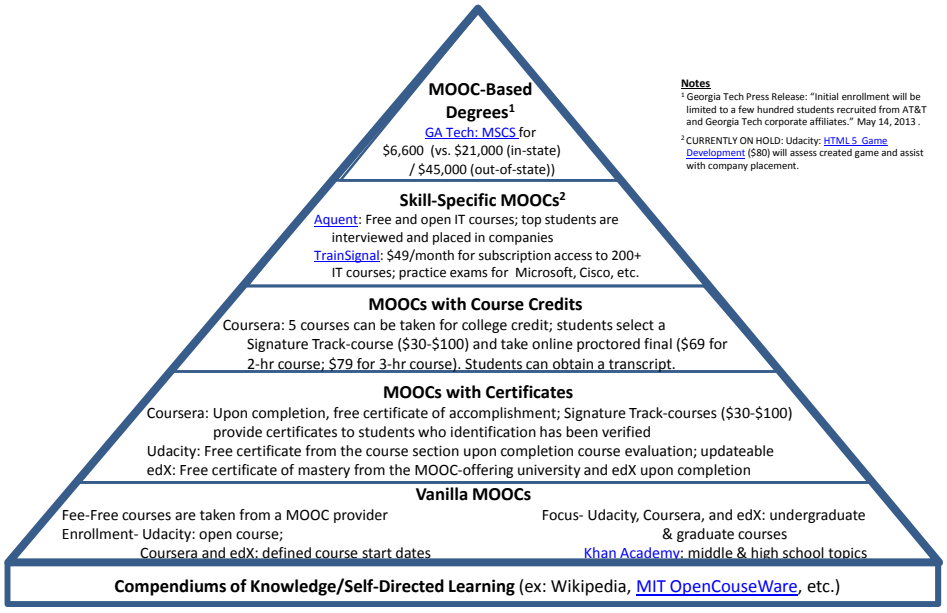
# MOOCs: evolution of distance learning

- MOOCs allow teaching at scale: Improvements in bandwidth and software innovations→ improved speed and quality of communication among large numbers of students and between students and teachers.
- New technologies used in MOOCs allow teachers to measure student comprehension in real time/adjust the material.
- MOOC platforms collect massive amounts of data (about students and their behavior using the platform in real time and over the duration of a course), which can be used to understand the effectiveness of different curricular materials and different approaches to teaching.
- MOOC technologies offer potential measurement of student progress based on learning/competency outcomes—not the number of hours spent in class.

# MOOCs: evolution of distance learning cont'd

- New industry has emerged for developing/supplying MOOC platforms/technologies.
- Multiple platforms for MOOC offerings: for-profit company + residential colleges/universities; non-profit company + residential colleges/universities; for-profit company only

# Hierarchy of MOOCs




**Notes**

[1] Georgia Tech Press Release: "Initial enrollment will be limited to a few hundred students recruited from AT&T and Georgia Tech corporate affiliates." May 14, 2013 .

[2] CURRENTLY ON HOLD: Udacity: HTML 5 Game Development ($80) will assess created game and assist with company placement.

# MOOCs and other online technologies: Caveats and concerns

- Use of MOOC platforms is still at a very early stage→ it is likely that failed experiments will outnumber successful ones.
- Online courses may not fully replace/recapitulate aspects or benefits of residential college experience, i.e. encouragement of critical thinking skills development, intangibles of personal contact with instructor, etc.
- Scalability of emerging education technology bears potential to increase access/lower higher education cost---however, ancillary services (housing, food, healthcare, etc) also account for increased expenses for residentially-based education.
- After just two years of practical experience with MOOCs and related technologies, it is too early to tell whether substantial gains in the quality of instruction, access, achievement, and cost will be realized—however, their promise is quite evident.

# PCAST Recommendations

- Let market forces decide which innovations in online teaching and learning are best.
- Encourage accrediting bodies to be flexible in response to educational innovation.
- Support research and the sharing of results on effective teaching and learning.