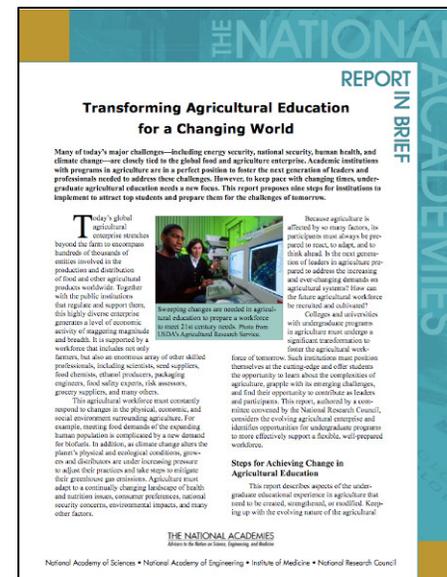


# Transforming Agricultural Education for a Changing World

**Adam P. Fagen, Ph.D.**  
**Study Director**  
**Senior Program Officer**  
**Board on Life Sciences**

**THE NATIONAL ACADEMIES**  
*Advisers to the Nation on Science, Engineering, and Medicine*



**Council of Environmental Deans and Directors**  
**July 8, 2009, Airlie Center, Warrenton, VA**

Although there are many examples of excellent, up-to-date programs, the report was motivated by several concerns about agricultural education nationwide:

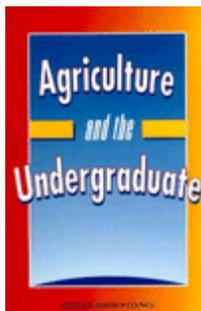
- Need for agricultural expertise in solving global challenges
- Agricultural education not keeping up with the changing nature of agriculture
- Agriculture often isolated from other disciplines
- Academic institutions often isolated from other sectors and employers
- Changing student demographics → fewer from rural backgrounds, mismatch between population and agricultural disciplines
- Students are not aware of the opportunities in food and agriculture careers
- Employers are looking for skills, competences, and abilities not always found in agriculture graduates
- Research on how people learn and research-based pedagogies not used to inform classroom practice

# Genesis of study

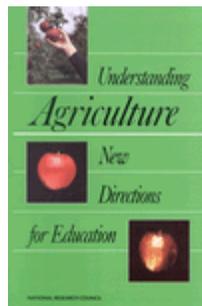
# NATIONAL

# ACADEMIES

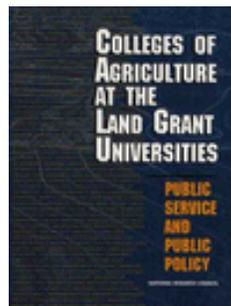
Follow up to previous National Academies reports on agricultural education



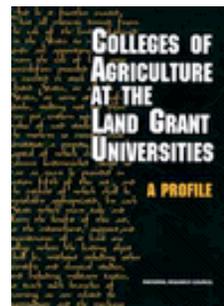
1992



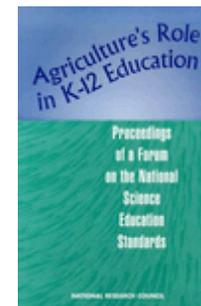
1988



1996

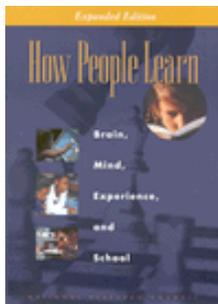


1995



1998

and on undergraduate education



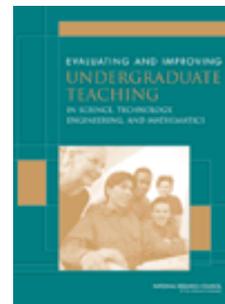
2000



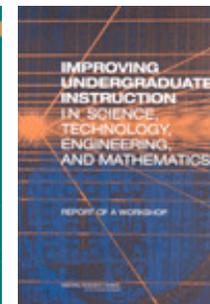
2003



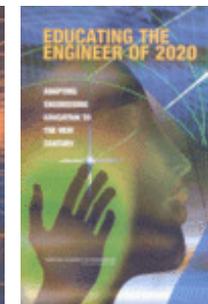
1999



2003



2003



2005

# Statement of Task

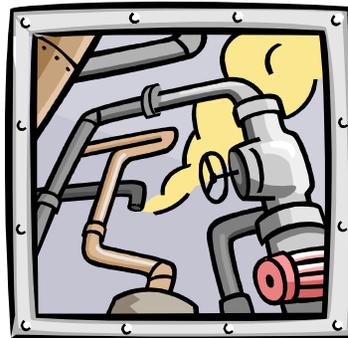
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- 2-day summit of educators, employers, and others
- Improve the undergraduate learning experience for students in agriculture, environmental and life sciences, and related disciplines
- Innovations in teaching, learning, and the curriculum
- Adaptive to differences in student backgrounds and career paths
- Produce a flexible, well-prepared workforce that is appropriately skilled, socially responsive, and technically proficient

- Reinforces the continuing promise of agriculture and land-grant institutions, while describing the need for change
- Emphasizes interrelatedness of agriculture with other disciplines, including environmental science
- Argues that agriculture should take its place among the other science disciplines: from STEM to STEAM

- Science
- Technology
- Engineering
- Agriculture
- Mathematics



- Many recommendations extend beyond agriculture

## Broaden agriculture within the overall curriculum

- Develop and teach joint introductory courses  
*Similar topics addressed in different courses and majors*  
*Students would benefit from making connections more explicit*
- Coordinate existing courses through more integrated syllabi  
**and environmental**
- Incorporate agricultural examples and topics into other courses



## Broaden the student experience

- All students should develop transferable skills  
(e.g., *Communication, Teamwork, Management*)
- Participate in undergraduate research
- Participate in outreach and extension
- Participate in internships and other programs beyond the institution
- Expose to international perspectives through learning-abroad programs and international perspectives in existing courses
- Students should have extensive participation in one of these elements



## Reward exemplary teaching

- Enhanced institutional rewards for teaching, curriculum development, mentoring, etc.

*Rigorous consideration in hiring, tenure, and promotion*

*Tenure-track faculty appointments emphasizing teaching and education research*

- Funding agency support and reward for teaching excellence in education and research grants

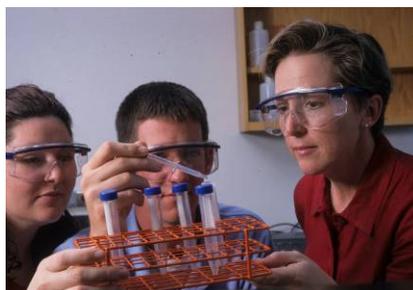
*Consider using “broader-impacts criterion” for awarding grants and contracts*

- Professional societies raise profile of teaching in the discipline

*Education sessions and speakers at society meetings*

*Education-focused articles in society publications*

*Development and dissemination of teaching materials*

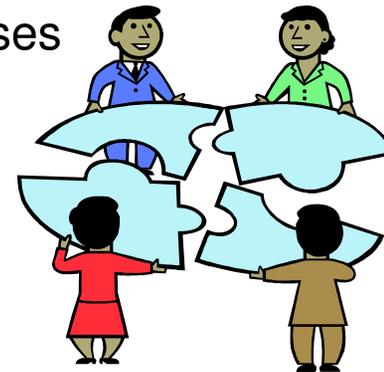


## Prepare faculty to teach effectively

- Promote and support ongoing faculty-development activities at institutional, local, regional, and national levels
- Particular attention to future faculty (graduate students and postdocs)
- Responsibility of departments of colleges, not only individuals
- Devote necessary resources
  - Faculty release time*
  - Teaching assistants and other instructional staff*
  - Participation in education-focused meetings*
  - Development and use of education materials and technologies*
- Role for academic institutions, professional societies, funding agencies

## Connect higher education institutions

- Support and develop new opportunities and student pathways
- Articulation agreements and transfer partnerships
- Establish and support joint programs and courses  
*Leverage resources across institutions*
- Particular focus on community colleges and minority-serving institutions



## Reach out to K-12 students and teachers

*and environmental*

- Generate early interest in agricultural careers
- Work through formal and informal programs

## Build strategic partnerships

- Bring employer voices to the academy
  - Representatives of employers on visiting committees and advisory boards*
  - Enable professionals to teach and engage students at academic institutions*
- Bring academic voices to employers
  - Invite faculty to serve on advisory committees*
  - Enable faculty to spend sabbaticals outside of the academy*
- Expose students to non-academic settings
  - Greatly expand internships, cooperative education programs, career programs, etc.*



## Engage in strategic planning

- Involve stakeholders within and beyond the institution

*Faculty in and outside of agriculture*

*Current and former students*

*Employers*

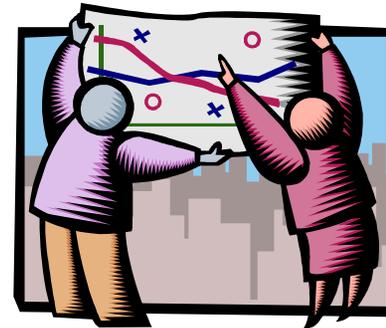
*Disciplinary societies*

*Commodity groups*

*Local and community organizations*

*Farmers*

*Representatives of the public*



## Focus reviews of undergraduate programs and departments

- Curriculum and student experiences
- Institutional commitment to teaching and learning
- Outreach and organizational structure

# Study Committee

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- Peter J. Bruns, *VP for Grants, Howard Hughes Medical Inst.*
- Vernon B. Cardwell, *Distinguished Teaching Prof., U. of Minnesota*
- Karen Gayton Comeau, *Past President, Haskell Indian Nations U.*
- Kyle Jane Coulter, *Past Deputy Administrator, USDA/CSREES*
- Susan J. Crockett, *VP and Sr. Tech. Officer, General Mills, Inc.*
- Theodore M. Crosbie, *VP for Global Plant Breeding, Monsanto Co.*
- Levon T. Esters, *Asst. Prof. of Ag. Education, Iowa State Univ.*
- A. Charles Fischer, *Past President & CEO, Dow AgroSciences LLC*
- Janet A. Guyden, *Assoc. VP & Graduate Dean, Grambling State U.*
- Michael W. Hamm, *Mott Prof. of Sustainable Ag., Michigan State U.*
- Michael V. Martin, *Chancellor, Louisiana State Univ.*
- Susan Singer, *Gould Prof. of Natural Sciences, Carleton College*
- Larry Vanderhoef, *Chancellor, Univ. of California, Davis*
- Patricia Verduin, *VP, Global R&D, Colgate-Palmolive Co.*
- Adam P. Fagen, *Study Director*

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The banner features a teal background with a faint, stylized image of a globe and binary code (0s and 1s) overlaid. The text 'NATIONAL' is written in large, bold, yellow capital letters across the top right portion of the banner.

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