

ISyE 8803A

TRANSFORMING ACADEMIA

Historical Developments, Contemporary Perspectives and Implications for Georgia Tech

Spring 2011

The first universities in Europe -- University of Bologna (1088), University of Oxford (1096), University of Paris (1150), University of Modena (1175) -- began as private corporations of teachers and their pupils. Soon they realized they needed protection against local city authorities. They petitioned secular power for privileges and this became the model for academia.

The organizational structure of disciplinary departments, schools, and colleges emerged in the process. The secular independence and this organizational structure represent the first major transformation of academia. These characteristics of academia have persisted for over 900 years and seem immutable. Yet, notable transformations of academia have occurred more recently.

Land-grant colleges and universities are U.S. institutions benefiting from the provisions of the Morrill Act (1862), which gave to the states federal lands for the establishment of colleges offering programs in agriculture, engineering, and home economics as well as in the traditional academic subjects. This transformation more closely linked academia to society and economic development.

Between the 1880s and the 1920s, the German system of scientific research, traditionally dominated by the universities, underwent rapid institutional change and functional differentiation, resulting in the formation of national research institutes that were much more interdisciplinary in nature than typical German universities at that time. It has been argued that this served as an important factor in Germany's transition from a predominantly industrial to a primarily knowledge-based society.

Several contemporary forces portend another transformation of academia:

- Information and communications technologies have enabled distributed and relatively virtual organizations, both for education and research
- Social technologies are fostering increasing collaborative interactions, with implications for education and research
- Research challenges have become increasingly interdisciplinary, or even transdisciplinary, requiring greater networking among organizations
- Traditional State and Federal funding sources are under continual stress of demands for resources, heavily constraining support for academia

This seminar will address both the history of and prospects for transforming academia. Students will research the nature of historical changes of pedagogy and inquiry. They will also study the changing social and economic roles of academia over the centuries. They will compile lessons learned in terms of driving forces, tipping points, and consequences of change. Students will then apply this knowledge to formulating scenarios for future transformations of academia, including strategies for institutions to anticipate change, invest in competencies to excel at change, and leverage these competencies to assure a leadership position in the transformation of academia. The last four weeks of the seminar will focus on the implications of this material for the future of Georgia Tech.

Instructors: W. Rouse, R. DeMillo, R. Barke, L. McGinnis

Time: Monday, 3:00-5:30PM

Location: TBD

Topical Outline

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Date	Lead	Topic
Jan 10	Rouse	Introduction and Overview – Sharing of Biases
Jan 24	Rouse	Roots of the Modern University – Bologna, Paris, et al Universities in the Middle Ages, the Renaissance, and The Enlightenment
Jan 31	Rouse	Universities in America – From the Colonies through the Civil War Land Grant Universities – The Morrill Act of 1862 Fraunhofer Institutes
Feb 7	Rouse	Aftermath of World War II – Vannevar Bush, ONR, NSF, and Federal Support for Research Impact of the GI Bill on American Universities
Feb 14	DeMillo	Computer-Based Instruction – From Plato to Intelligent Tutoring Systems
Feb 21	McGinnis	Distance Education – From Video to Internet
Feb 28	Rouse	Online Universities – Primary Competitors and Value Propositions
Mar 7	Rouse	Contemporary Drivers of Fundamental Change in Higher Education
Mar 14	Rouse	Cost Structures of Contemporary Universities – Sources and Uses of Funds
Mar 28	Rouse	Scenarios for the Future – Alternative Business Models, Including Intellectual, Social, Political, and Economic Implications for Value Delivery
Apr 4	Barke	Georgia Tech's Current Business Model
Apr 11	Barke	Alternative Future GT Business Models
Apr 18	Rouse	Implications of Alternative Futures
Apr 25	Rouse	Recommendations to GT Leadership

Instructors:

- William Rouse, ISyE & CoC
- Richard DeMillo, CoC
- Richard Barke, Public Policy
- Leon McGinnis, ISyE & ME

QUESTIONS FOR EACH TOPIC

(Questions to Guide Preparation of Students' Presentations)

1. What changes happened in this period and what drove these changes?
2. What was happening more broadly in society during this period?
3. Who was educated, how did they pay for it, and did it cover all costs?
4. How was access to university education allocated? How should it be now?
5. How have changes in student demographics (race, gender, age, etc.) affected the roles and behavior of universities?
6. Where did academia's financial resources come from; how were they expended?
7. What was the typical business model of a university of this period?
8. How were teachers educated, selected and paid?
9. How were universities, programs and teachers evaluated?
10. When and why did tenure emerge and how has it changed?
11. When did endowments and gifts start to play a major role?
12. When and why did the notion of tuition and fees emerge?
13. What are the roles of disciplines, departments, and schools in academia?
14. How do new disciplines, departments, and schools come into existence? How are they eliminated?
15. When and why did the constructs of majors and minors emerge?
16. How did the degree structure (BS, MS, PhD) come about?
17. How did the idea of courses, semesters, etc. emerge?
18. What are the basic elements of learning in higher education (e.g., reading, labs, lectures, projects, etc.) and how are they assessed?
19. What aspects of student development do universities support in addition to education and training?
20. When did research get added to the mission of the university?

21. How was research funded and evaluated?
22. When did service get added to the mission of the university?
23. How was service funded and evaluated?
24. When and why did rankings of universities and programs emerge?
25. When and why did sports become important and expensive?
26. What has been academia's relationship with industry and government?
27. What has been the public's attitude towards higher education?
28. What are the current roles of the various stakeholders (students, faculty, administrators, trustees, legislators, research funders, student employers, etc.) in shaping the structure and function of the university?
29. How will American universities be affected by the rise of new universities in the developing world, especially India and China?

Reading List

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Barke, R. (2000). Sustainable Technology/Development and Challenges to Engineering Education. Proceedings of the American Society for Engineering Education, St. Louis, MO.

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