Support for the Sciences in Regional Comprehensive Universities

Participants

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- Bret Danilowicz (Georgia Southern University)
- Steve Brown (Emporia State University)
- Pat Mosto (Rowan University)
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Topics

- Delaware Study (Danilowicz)
- Graduate Programs (Brown)
- Equipment Issues (Mosto, Golich)
- Enrollment (Duben)

Delaware Study

Delaware Study

also known as
National Study of Instructional Costs and Productivity

The Delaware Study is for comparative analysis of faculty teaching loads, direct instructional cost, and separately budgeted scholarly activity, all at the level of the academic discipline.

It is a versatile and highly useful analytical tool for making management and policy decisions, whether at the level of the academic department, institution, state, or national level. Over 500 universities participate annually.

www.udel.edu/IR/cost/

Delaware Study Fall 2006 National Normed Means

Discipline/Carnegie Classification		FTE student taught	FTE * sections taught	Cost per FTE taught
Mathematics				
	Research	**19.9**	57.7	4,586
	Doctoral	**20.1**	**66.3**	4,211
	Comprehensive	18.8	**65.8**	4,208
	Baccalaureate	16.4	**64.0**	**4,050**
BIOLOGICAL AND BIOCHEMICAL SCIENCES				
	Research	15.4	41.6	8,761
	Doctoral	16.7	63.5	5,694
	Comprehensive	**17.6**	**79.2**	**5,368**
	Baccalaureate	14.7	70.6	**5,405**
Chemistry				
	Research	**16.6**	58.1	7,420
	Doctoral	**17.0**	62.9	6,709
	Comprehensive	15.1	**71.0**	**6,246**
	Baccalaureate	13.6	63.9	7,244
Physics				
	Research	14.7	45.6	7,399
	Doctoral	**15.3**	58.1	6,914
	Comprehensive	**15.4**	**69.3**	**6,251**
	Baccalaureate	12.7	62.2	6,407
Geological and Earth Sciences/Geosciences				
	Research	14.4	40.3	8,229
	Doctoral	**19.5**	**70.2**	**5,074**
	Comprehensive	16.8	**70.6**	6,063

All participants have access to all data

Delaware Study Fall 2006

Comprehensive University Summary			
	FTE taught	Workload	Cost/FTE taught
Mathematics	18.8	65.8	4,208
Biol. Sci.	17.6	79.2	5,368
Chemistry	15.1	71.0	6,246
Physics	15.4	69.3	6,251
Geology	16.8	70.6	6,063

If these were your Science Departments, which might be at risk…and why?

Geology Program Closures 1998-2004

Need to protect small, “poorly understood” departments
IF and ONLY IF they serve a critical function to your mission

Delaware Efficiencies help protect small 'vital' departments

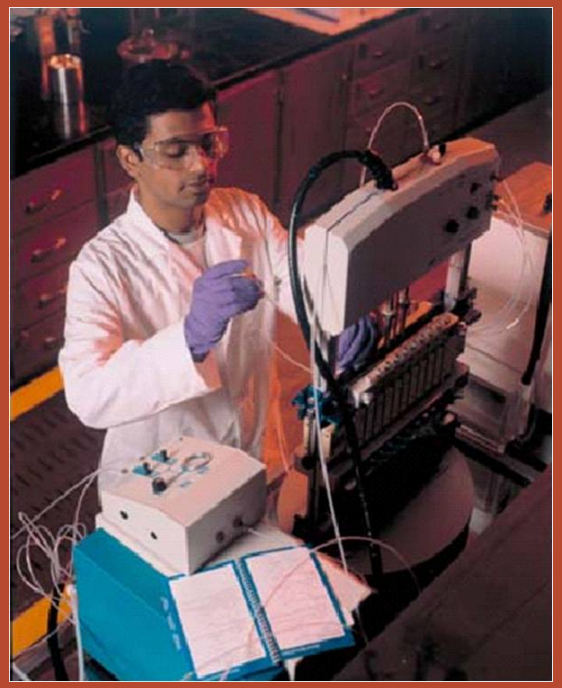
	GaSou COST/FTE Student	All Comprehensive	Comps - GaSou	Total Student FTE	Net Gain/Loss compared to comprehensives	Per FTE Fac Net
COST					**$5,086,281**	**$30,011**
Engineering	$6,391			547		
Technology		$6,889	$498		$272,301	$8,761
Biology	$4,132	$5,368	$1,236	824	$1,018,350	$26,707
Chemistry	$4,992	$6,246	$1,254	400	$500,959	$27,330
Geology/Geosciences	**$3,203**	$6,063	$2,860	**428**	$1,225,177	**$92,676**
Physics	**$3,648**	$6,251	$2,604	**302**	$786,465	**$61,443**
Mathematics	$3,197	$4,208	$1,011	1269	$1,283,030	$22,944

Use efficiencies for comparative positioning against other colleges too!

Challenges of Graduate Study in the Sciences in Regional Comprehensive Universities

Ambiguity of Purpose

- aspirations of faculty members
- often trained at research institutions
- believe that is the only appropriate track
- rewards system reinforces this belief



Increasing Lack of Perceived Value of Masters Degree

- Growing numbers of students move directly into Ph.D. programs
- M.S. still has validity in secondary education
- Some utility in government agencies, e.g., wildlife management. *However even in such settings, those with M.S. degrees are often employed as lab technicians.*

Basic Inability to be Competitive with Research- Intensive Institutions

- Lack of equipment, resources (facilities and human resources)
  - Institutional grant assistance
  - Development/foundation representatives specific to sciences
  - Lab technicians, support staff
- However – education in the sciences must be founded upon continual and extensive opportunities for research. Students without research backgrounds are ill-prepared for the sciences.
- All this suggests that in order to be competitive with faculty members from research institutions, those at comprehensives must devote a proportionately greater amount of time and energy, thus further compromising teaching activities.

Potential Steps Toward Solutions

- Make an institutional determination of the purpose, scope, and nature of scientific programs. Be certain that determination is the foundation of staffing, funding, and curricular decisions.
- Redirect institutional culture, reward systems, etc.
  - Acceptance of pedagogical research as valid in tenure / promotion consideration, sabbaticals, etc.
- Develop partnerships and programs with industry, government, and others that would provide opportunities for practical experience and internships as students move through the M.S. toward the Ph.D.

Laboratory Equipment

Equipment/lab costs

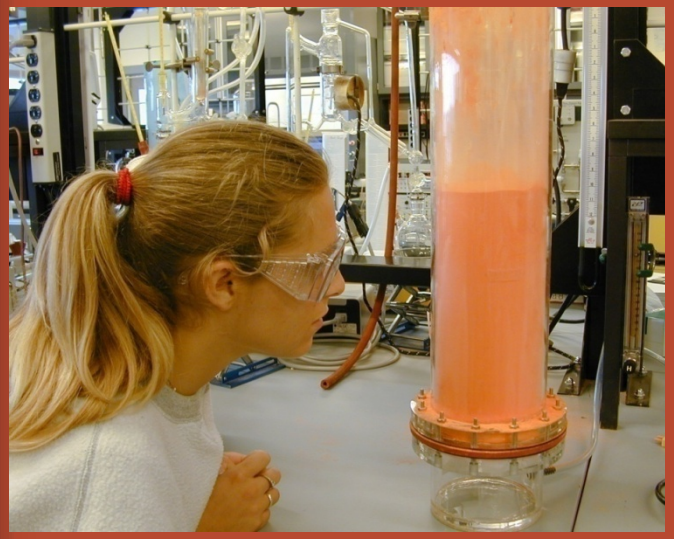
The sciences are different from other disciplines, since they need to:

- Purchase expensive equipment
- Provide laboratory space
- Restock chemicals and lab supplies constantly
- Maintain scientific instruments
- Operate properly laboratory facilities

How are costs covered?

Rowan model:

- Departmental budgets
- Inter-collaboration between science and engineering



CSUSM model:

- Departmental budgets
- Special allocations reviewed and approved by College Budget Committee
- California State Lottery Funds allocations

How funds for research and lab equipment are acquired?

Rowan Model:

- Federal and state grants
- Industrial partners
- Internal networking (primarily engineering)

CSUSM model:

- Federal and state grants
- Corporate donations
- Internal networking (primarily nursing)
- Endowments derived from “naming opportunities” (provide at least partial support)

Other issues and Questions

- How instruments are maintained?
  - Licensing agreements
  - FEMA funds
- How technicians or staff are supported?
  - Departmental funds
  - Funds from IT services
  - College funds

Enrollment Issues

Undergraduate Students

- Most of enrollment is undergraduate.
- University admission standards – often lower than at flagship research universities
- Heavy service load by students not in science – general education, nursing, elementary education
- Large attrition rate from college in the first year.
- Upper division courses have low enrollment creating negative attention.
- Low percentage finally graduate in the sciences or mathematics.

Coping with Attrition

- Preparation in mathematics usually weak
  - Many need to take remedial math to begin credit bearing study with College Algebra
  - However, math requirements for Math, Chemistry, Physics, Geology, Computer Science, Engineering majors begin with Calculus
  - Many science major courses are unavailable to students in remedial math.
- Work habits often unsatisfactory – low expectations from high school
- Use mid-term grades with career and academic advising
- First year as “audition year” with rite of passage in the following fall.

Marketing Efforts to Attract Qualified Students

- Small class sizes, opportunities for undergrad research, jobs for undergrads as teaching assistants
- Identify and emphasize niches
  - Pre-medical and related health career preparation
  - Licensure as high school teachers of science or mathematics
  - Organismal biology – botany, zoology, ecology
  - Biochemistry
  - Astronomy (for Physics)
  - Geology