

The Accountability Handbook from the University of Florida

John V. Lombardi and Elizabeth D. Capaldi



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Table of Contents

I. Introduction	1
Florida Quality Evaluation Project	3
Undergraduate Education	8
Research.....	13
Performance Based Budgeting	15
II. Measuring University Performance	i
State Support [August 1, 1995].....	1
Teaching [September 1, 1995].....	4
Classrooms [October 1, 1995]	7
Research [November 1, 1995].....	10
Excess Hours [December 1, 1995]	13
Transfer Students [January 1, 1996].....	16
Research Benefits [February 1, 1996]	19
Student Quality [March 1, 1996]	22
Financial Aid [April 1, 1996]	25
III. Conclusion.....	28

Introduction

In this era of constant competition for scarce resources universities enjoy no immunity from measuring their performance and their quality as they account to those who provide support. This handbook describes measures taken at the University of Florida over the past four years to measure productivity and quality. This operational manual begins with a description of the data structure needed to implement an accountability process, called at the University of Florida the *Florida Quality Evaluation Project*. This internal planning and evaluation instrument measures the resources, expenditures, productivity, and quality of the university and each of its units, it presents changes in performance from year to year, and it compares our performance to that of our national peers. The *Florida Quality Evaluation Project* document consolidates financial information with data on the quality and productivity of programs.

At most universities, including the University of Florida, data relevant to managing the university are stored and reported in different offices. We keep financial data separate from student data which in turn exist separately from faculty data. An accountability process must consolidate all these data for reporting purposes, if not for bureaucratic storage, so we can manage the money in ways that encourage and reward productivity and quality. Once we combine financial and academic data, we can analyze productivity and quality in terms of resources. We have not completed this data consolidation, and no one should underestimate the difficulty of this process at large, highly bureaucratized public institutions. Each set of relevant data exists within its own constraints imposed by tradition, state or local rules, or technological limitations; and each data source has well established reasons for being kept and reported in a particular fashion.

We often keep financial data on a different time cycle than academic data, we account for financial data by fund and not by function, and we include accruals and balances for some money and not for other funds. The state has rules and reporting requirements for specifically state money that do not apply to non-

state money (approximately two-thirds of the resources at the University of Florida are from non-state sources). Instead, each source of non-state money has its own requirements for combining and reporting data.

Part I of this handbook reviews the results of data consolidation at the University of Florida, a process begun in 1991. We have succeeded in developing a consolidated data report, but the numbers included in it do not yet match the financial statements of the university. The financial statements, and the data reported to IPEDS which are used for many national reports, rest on fund accounting and report expenditures in any fund by the majority of the function in that fund. At the University of Florida each academic department has a single account number, but each department does not have a single function. Departmental expenditures, however, are all reported by the majority function of the department, which is instruction for most departments. Lumping all the expenditures of the academic departments into instruction removes from view and analysis the department's expenditures for research and public service and other activities of the faculty and staff.

In an effort to avoid this tremendous source of inaccuracy that renders most inter-institutional comparisons based on IPEDS useless, the Florida Quality Evaluation Project allocates all expenditures proportional to the effort of the faculty as explained below. Although we can map this reporting scheme to the fund accounting used in financial statements, the rules governing financial statements do not allow us to modify the financial statement without setting up an explicit fund for each aspect of faculty effort, something that may or may not be worth the work involved.

After developing our consolidated data, we turned first to analysis of undergraduate education. This analysis produced a rough measure of the sources of inefficiency in undergraduate programs expressed as the hours students take beyond those required for their degree. Our tracking program developed as a result of this analysis provides each undergraduate student with an optimum individual path through

the curriculum towards their degree. Tracking provided the critical structure for the proposed new funding methodology for undergraduate education labeled Degree Funding. This method limits state support to the credit hours required for a degree plus a 10% margin for adjustment and assigns the university and the student joint responsibility for hours needed beyond this number to complete the student's degree. Degree funding is one critical element in a performance based budget for the University of Florida. The second element is a rough measure of the state's return on investment in research productivity and quality for the university as a whole, the ratio of

external dollars generated to state money invested. This performance based budget ties the annual budget directly to annual measures of performance in an automatic feedback process.

The last section of this handbook displays our paper series *Measuring University Performance*. This monthly publication analyzes selected areas of university performance for a continuing understanding of areas of strength and weakness. We choose topics that address current issues relevant to one or several of our major constituencies within and outside the university community.

The Florida Quality Evaluation Project

The complexity of the university's products and the greatly varied time frame for determining their total economic value make the general business profit-and-loss mechanisms difficult to adapt for university management. At the same time, most universities have accounting structures oriented towards the integrity of fund management rather than towards the analysis of costs and the evaluation of benefit. To improve the quality and productivity of our programs without the normal private enterprise tools of profit-and-loss analysis that support the delivery of stockholder profit, we have chosen instead to use benchmarking strategies that evaluate our programs within the context of the strong institutions in our competitive marketplace. This strategy prompted the university to invent an on-going program called The Florida Quality Evaluation Project as the internal planning and evaluation mechanism at the University of Florida.

This accountability project has as its major product an accounting mechanism that records university expenditures and incomes along with a range of productivity and quality indicators in an annual report format. This document (*FQEP*) attempts to translate the fund accounting information, the quality evaluation information, and the productivity information collected in various formats by the university into a consistent and comparable report on the performance of departments, colleges, and the divisions of the institution. This report then can serve legislators, faculty, students, staff, administrators, and other interested observers specific and consistent data reflecting the university's effectiveness.

FQEP data demonstrate the relative effectiveness of the various colleges and programs in generating funds for teaching, research, and service and illustrate how the university spends these funds. The Florida Quality Evaluation Project requires that the *FQEP*

document include all revenue, whether from state, federal, private, fee for service, contract, or tuition sources. The Florida Quality Evaluation Project also enables the University of Florida to benchmark the quality, effectiveness, and productivity of its programs against a reference group chosen from the membership of the Association of American Universities (AAU) public universities.

In the end, *FQEP* data ensure that the University of Florida remains accountable to its many constituents, from the university's Board of Regents, to the political authorities of legislature or cabinet or governor, to donors, citizens, students, foundations, and others who care about and contribute to the success of the university.

FQEP data come in two major sections. Part I of *FQEP* reports the standard data for each unit of the university for the academic and fiscal year. Organized in terms of the units, colleges and academic support units on campus, Part I captures sources of funds (resources), uses of funds (expenditures), and a variety of productivity measures. The evaluation of productivity requires a consideration of both the resources available relative to other units and the uses made of these resources. These data offer a measure of the contribution of each unit to the three missions of the university in teaching (graduate and undergraduate), research, and service.

Key to the understanding of productivity is the concept of effort. In the universe recognized by *FQEP*, every full-time faculty member of the university appears as 100% effort. We do not measure the actual effort (hours for example) but instead, we start from the assumption that all full time equivalent faculty work 100% for the University of Florida and when the university allocates resources to that faculty member in terms of salary or support, it is in exchange for 100% effort.

Then, we distribute portions of that faculty member's effort among the university's various functions, principally research or teaching, but also including academic administration, service, and other activities. We then have a mechanism to allocate cost to the effort of the faculty and to distribute the cost of other support functions to the primary functions of teaching and research. While this model has an element of arbitrariness, it has the virtue of focusing our attention on what our faculty do and how they allocate their talents and abilities. It also avoids the endless and irrelevant arguments about time spent on a particular task. The effort of each faculty member is a formally designated assignment derived from an agreement between the faculty member and the department.

Consequently, faculty effort devoted to any particular university purpose, expressed as a percent of total faculty effort, becomes an excellent unit for analyzing cost and determining productivity.

In Part I of *FQEP*, we also have the ability, using the effort model, to distinguish between the effort, and its associated productivity, funded from State of Florida resources and the effort funded from other, non-state resources such as grants, contracts, clinical fees, tuition, and the like. *FQEP* data include all funds generated and spent by the University of Florida in the fiscal year and represent a complete accountability report. The following provides a summary of the sections of Part I of the *Florida Quality Improvement Project* report with a comment on

(Florida Quality Evaluation Project: Generalized Report Format)

RESOURCES AND EXPENDITURES OF FUNDS

Resources								
	State	Tuition & Fees	Sponsored Research: Indirect Cost Generated	Sponsored Research: Indirect Cost Allocated	Sponsored Research Direct Cost	Private	Auxiliaries	Total
Academic Units								
College A								
College B								
etc.								
Support Units								
President's Office								
Academic Affairs								
etc.								

Expenditures							
	Salaries	Temporary Personnel	Expense	Equipment	Electronic Data Processing	Other	Total
Academic Units							
College A							
College B							
etc.							
Support Units							
President's Office							
Academic Affairs							
etc.							

the usefulness of these data:

Resources include all sources of funds, state and non-state (sponsored research, private, miscellaneous gifts and grants, auxiliary services, and for the Health Center private practice plan) organized by colleges or academic support units. These tables illustrate the significant differences in the funding generated from external grant money, private funds, tuition and fees, and state dollars.

Expenditures distribute costs by category, including salaries, temporary personnel, operating expenses, minor equipment, data processing expenses, debt service, and a variety of special categories. These categories, defined by state and Regents rules, provide a rough guide to the expenditure patterns of each unit and permit a comparison of management across units. These differences also produce widely differing distributions of effort within units and among units. The university uses these data to help

maximize the effectiveness of each unit in the use of total faculty effort funded from different sources.

- In colleges with high external funding for research, we expect to find high total effort on research, relatively low effort on research funded by state sources, and relatively high effort for teaching funded on the state accounts.
- In units with lower external funding per faculty member, the state support of teaching effort will remain high but also the state's support of research effort will also likely be high. In these cases we look at the productivity from the investment of state resources in research and teaching to determine whether the institution is using its funds effectively to gain the maximum benefit from the various sources of revenue.

A special category of local funds captures expenditures from locally generated revenues

(Florida Quality Evaluation Project: Generalized Report Format)

PRODUCTIVITY DATA

	Effort					
	Instruction	Academic Advising	Research	Public Service	Academic Administration	Other
Academic Units						
College A						
College B						
etc.						
Support Units						
President's Office						
Academic Affairs						
etc.						

	Credit Hours					
	Lower	Upper	Graduate	Thesis/Dissertation		
Academic Units						
College A						
College B						
etc.						
Support Units						
President's Office						
Academic Affairs						
etc.						

such as housing, student activities, and athletics. These locally generated funds come from enterprises that, by definition, must earn the revenue to meet their expenses and are operated as cost and revenue centers, independent from the general university funds.

Faculty productivity and other productivity effort tables summarize the effort allocation to state-funded activities. *FQEP* reports state-funded effort for ranked faculty separately from other state-funded effort; for example, these might be unranked faculty, other teaching personnel, or non-ranked research personnel. These tables show the effort and then

resources spent on instruction, advising, research, public service, academic administration, governance, and other. In addition the same elements appear for the faculty and other personnel effort funded from sponsored research as well as other sources such as private funds.

These tables capture the complete effort of the faculty and staff that produce the work of the university, and the data make clear the different functions supported with state and non-state funds in the key areas of teaching and research.

Teaching productivity tables address a

(Florida Quality Evaluation Project: Generalized Report Format)

TEACHING PRODUCTIVITY DATA

	Sections Taught by Rank					
	Professor	Assoc Prof	Asst Prof	Instructor & Other Faculty	Adjunct	Other
College A						
College B						
etc.						
Support Units						
President's Office						
Academic Affairs						
etc.						

	Sections Taught by Level			Section Size			
	Lower	Upper	Graduate	1-30	31-60	61-120	>120
College A							
College B							
etc.							
Support Units							
President's Office							
Academic Affairs							
etc.							

	Degrees Awarded					
	Bachelor's	Master's	Doctoral	First Prof	Other	Total
College A						
College B						
etc.						
Support Units						
President's Office						
Academic Affairs						
etc.						

clear and focused interest of state legislators, parents, and citizens everywhere including the state of Florida. In developing these tables, we use a statistical artifact to represent the faculty effort. Called personyears, this label refers to a faculty member employed full-time for 12 months. Because many faculty have 9 or 10 month appointments, a faculty personyear represents a statistical artifact useful for data but not an accurate representation of an individual faculty member. Using this metric, the tables show the number of faculty personyears funded from state resources, sponsored research revenues, or other sources for each unit. We then view the productivity numbers in terms of the number of faculty personyears available to each unit and gain considerable insight into the following teaching related productivity measures for each unit:

- credit hours taught at each level (lower division undergraduate through Ph.D. dissertation)
- course sections taught by faculty in each rank (professor, associate professor, assistant professor, instructor and other faculty, graduate assistant, adjunct faculty, and other)
- course sections taught at each level (freshmen and sophomore level, junior and senior level, graduate classroom, and thesis/dissertation)
- course sections taught by size of class (number of students in class)
- degrees awarded including undergraduate, graduate, and professional.

The second part of *FQEP* provides benchmarking data which each unit provides on a three year cycle. The benchmarking in Part II of *FQEP* requires each unit to compare itself to the comparable unit at three large, high quality, comprehensive, land-grant, research universities: The Ohio State University, the University of Minnesota, and the University of Illinois. These

three universities have the size and academic scope most comparable to the University of Florida among the AAU public institutions, and they have the excellent quality and productivity against which we compete. In addition to these core comparators, each unit then adds seven others from among the AAU public institutions that also have exemplary programs. This method gives both a standard benchmark for all units and a range of program or discipline specific benchmarks for particular competitive programs.

Because the scientific fields, the arts and humanities, and social sciences measure quality of research differently, each unit picks its own quality indicators and provides data to validate the appropriateness of these indicators. Principal among these validation criteria are the existence of national comparative data for these indicators that include the University of Florida and our specific benchmarked institutions.

In presenting these benchmarking data, we use the university's aggregate measures as the reference for the public and the legislature. This reflects the need to present relatively straightforward data without the endless detail required to inform college or departmental level decisions.

Although we organize the university and recruit and retain faculty within a holistic notion of university education that joins undergraduate instruction, graduate education, research productivity, and service in a mutually reinforcing structure, efficiencies in operation require us to examine each component of our institution's productivity separately to determine how we can best maintain quality under current conditions. We focused considerable attention in this effort on undergraduate instruction, reflecting its importance in our institution's mission and the intense public and legislative interest in this function. This is the topic of the next section of this handbook.

Undergraduate Education: Access, Excess Hours, Degree Funding, and Incentives

Background

In responding to the tremendous increase in student demand for access to higher education, the University of Florida admitted more students, offered more courses, and expanded its degree programs. At the same time, state support for higher education continued to drift downward and tuition and fee revenue remained constrained by legislative limitations. This pressure on resources and capabilities, driven by the recognition that a college education is a requirement for reasonable employment opportunities in the future, forced universities to re-examine their curricula, re-organize their operations, and seek economies that permit them to maintain quality in the face of rising demand and stagnant resources. The University of Florida is no exception. This study of undergraduate education speaks to the process and cost of undergraduate degrees at the University of Florida. It does not address the issues of quality or curricular content which belong to the faculty.

Basic Indicators

Undergraduates comprise about three-quarters of the students at the University of Florida (28,761 of the 37,678 students). They pursue some 94 different degree programs with a variety of possibilities for dual degrees and minors. These undergraduates include 68% or 21,447 who began their college careers at the University of Florida and 20% or 5,861 who transferred to the university from community colleges (the remaining 12% transferred from

other universities, are post baccalaureate students, or have some other classification). Every calendar year, the university graduates about 5,500 students with undergraduate degrees.

The university spends about \$122 million each year on undergraduate education. Of that amount, about 35% (\$41.1 million) comes from matriculation and out-of-state fees, and about 65% (\$78.6 million) comes from the state legislature through an appropriation. Undergraduate students take a total of about 800,000 credit hours (812,533) each year representing a large variety of courses, seminars, laboratories, field work, discussion sections, and individual supervised projects.

Surveys of recent graduates indicate that while students appear quite satisfied with the quality of the instruction they receive in their undergraduate classes, they find the process and management of the degree process confusing, complex, and inefficient. Much of this dissatisfaction appears focused on academic advising, drop/add, and registration. These targets, however, appear more as symptoms of a problem of academic organization and effectiveness than a cause. Students who cannot find the courses they need at the times they prefer during registration must engage in drop/add, seek special academic advising, and frequently end up dissatisfied with the results. Faculty and departments often find themselves without adequate data or organizational structures to anticipate student demand or to acquire the resources to meet it in a timely and effective fashion. This mismatch of demand and supply

Reasons for Excess Credit Hours

Reason for Excess Credit Hours at Graduation	Percent of total	# Credit Hours
Changed majors	9	2.0
Took minors not required for graduation	10	2.3
Dropped, failed or repeated courses	31	7.1
Transfer credits not used	25	5.8
UF hours (maintain financial aid status, enhance skills, preparatory work, needed course not available)	31	7.1
Categories overlap so total is greater than 100% and greater than 23 credit hours		

**Credit Hours Not Used Towards the Degree
CC Transfers vs. UF First Time in College**

	Number of Students	Community College Credit Hours	4-Year Transfer Credit Hours	UF First Time in College Credit Hours	Total Credit Hours/ Student Not Used
First Time in College	1496	<1	<1	21	22
Community College Transfer with AA	531	12	1	11	24
Transfer from 4-year institution	369	4	7	12	23

produces delayed student graduation, excess credit hours taken toward degrees, under-used faculty and staff resources, and over-burdened support facilities.

A key indicator of this organizational issue appears in the difference between the number of credit hours required for an undergraduate degree and the number of credit hours students actually take before earning that degree. Students receiving baccalaureate degrees in the Spring 1994 (2,708 students) took on average 23 credits more than required for the degree. If this one graduating class had taken the number of credit hours required, UF would have taught 61,300 fewer credit hours to the graduating student, permitting the enrollment of 2,043 additional students.†

Excess credit hours are the key measure of inefficiency, not excess years. While many are concerned that students no longer graduate in four years, this is really not a valid concern. A student who registers for only 3 hours, allows another student to register for the remaining hours that would have constituted a full time load. So those hours are used. Part time students may take many years to graduate but they may graduate without any excess hours.

While this average represents a substantial number of credit hours in total, not all of the difference between the ideal and the actual number of hours is susceptible to management. For example, our analysis indicates that approximately 9% (about 2 credit hours) of the

extra credit hours resulted from students changing their majors once during their college career (about 83% of the graduating students never changed major or changed major only once). A third of the extra hours (about 7 credit hours) are due to students dropping, repeating or failing courses. Part of this overage may be susceptible to management by better advising, and part may not. About 25% of the credit hours not used (about 6 credit hours) were taken outside the University of Florida, and did not fulfill a requirement for the degree.

The remainder of the credit hours (about 7 credit hours) were taken at the University of Florida and were simply not used for the degree either because they completed a minor, or students took the hours to enhance their skills, expand their horizons, or maintain full-time status while seeking entry into restricted courses. These all represent elements of extra credit hours that offer an opportunity for improvement.

There was no appreciable difference between transfer students and students beginning at UF in total hours not used but sources of the unused hours were different. For community college transfer students with an AA, 12 community college credits were not applicable for the UF degree, while for students transferring from another 4-year institution 7 credits were not used. The remainder of unused credit hours came from UF.

Not all students took extra hours. One hundred and fifty-four students (5.69%) took exactly the credit hours required, 7% took only one extra course, and about a third of the class was within 9 hours of those.

† A complete statistical summary and a description of the methodology used in this analysis is available from the Office of Institutional Research at the University of Florida.

This analysis led the university to develop a tracking program designed to decrease the extra credit hours taken by graduating students and improve the university's graduation rate.

Tracking

In response to this analysis, the university began developing a tracking pilot program that would guide students throughout their undergraduate academic careers and provide a clear path through requirements to the achievement of a degree. The tracking program experiment received support from the legislature, and the university piloted a trial program with a small number of community colleges and entering university students. In Florida, the large community college system (28 community colleges) and the strong commitment to smooth articulation between community college and university programs (known as the 2+2 system) requires that any effort to improve efficiency and quality at the university must accommodate and include the community college students who will become university students in the junior and senior year. The pilot program experiment led to a number of improvements, and a full program called universal tracking begins for all undergraduate students at the University of Florida in the fall of 1996.

Under universal tracking, the university provides each undergraduate student with an optimum individual path through the curriculum that leads them to their degree objective. This track is easy to modify to reflect a different degree goal as students explore and discover their talents and interests. The tracking audit lists the courses required and electives possible as defined by the student's chosen degree program in a semester by semester sequence. The catalog also reflects these tracks for each degree beginning with the 1996 catalog. The tracking audit informs students which requirements they have fulfilled by courses already taken, requirements yet to be fulfilled, and the total credit hours attempted. Students stay on track if every course taken fulfills a requirement or counts as an elective in their required degree program and if they meet GPA or other requirements of their chosen program. If students change their majors or degrees, the university's universal tracking system generates a new audit that outlines the optimal path through the curriculum towards the new major or degree. The university mails the audit to

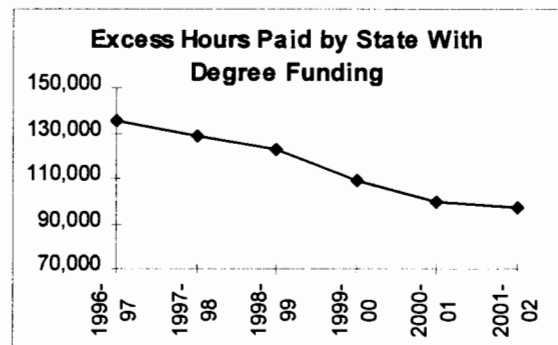
the student's local address each semester and students can also access the audit on-line.

Degree Funding

In addition to providing the critical element in a student-centered undergraduate system, universal tracking created the infrastructure for the successful implementation of the University of Florida degree funding proposal. This proposal, if adopted by the legislature and the Regents, could begin in the fall of 1996 for the University of Florida.

In an ideal world students could take as many extra hours as desired. However, the state of Florida cannot afford to pay for unlimited extra hours as the number of students needing access to the state's public universities continues to grow. A reasonable balance between the students' need for educational exploration and the state's need for greater access for all its citizens to higher education gives the student extra hours up to 10% of those required for their degree at state expense. The cost of excess hours beyond the 10% will become the responsibility of students and universities. This funding model gives both the universities and the students an incentive to reduce excess hours while also recognizing that students need some extra hours to fully meet the needs of their degree programs.

Degree funding creates the link between the productivity of the university in helping students earn degrees over a period of years with



the annual budget cycle of state funding. In degree funding, each university is funded for each student's degree requirements plus a 10% margin for changes and adjustments. Once the university and the student have used up this degree funding, the state reallocates the funds to support a new student. If the student has not graduated within the degree requirements plus 10%, then the university and the student must support the costs

of the rest of the student's undergraduate instruction. The student pays a surcharge and the university pays for the instruction without state support.

This mechanism of charging the student and the university for hours beyond those required plus ten percent provides an incentive for both university and students to reduce excess hours. Because the state does not pay for the excess hours beyond 10% for students in the Degree Funding program, as the number of these students increases, the number of excess hours paid for by the state decreases as shown in the chart. The state uses the dollars saved by not paying for hours over those required plus 10% to purchase access for new students. Thus, the state increases access to the University of Florida without an increase in funding, but rather through an increase in instructional efficiency. This system will extend to graduate education once the equivalent analysis of credit hours for graduate degrees has been completed.

Students may take as long as needed to complete their degrees, attending full or part-time as their obligations and opportunities require. If a community college student or other transfer enters the University of Florida the number of credit hours applicable towards a degree is computed and the state pays for the remaining hours of the degree program plus 10%. So, for example, a student who enters the university as a transfer with 50 hours towards a 120 hour degree can receive up to 70 hours plus 10% or another 7 extra hours for a total of 77 hours of state funded credit.

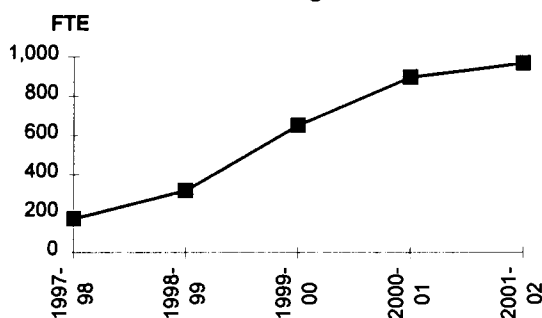
Students in the Degree Funding program will be billed at the standard tuition and fee rate for Degree Funded hours, and the university receives full formula funding for these hours. Degree Funded hours include those required for the degree plus 10% extra hours. For the excess hours taken beyond Degree Funding hours the state pays nothing. The university and student split the cost of excess hours beyond Degree Funding hours, motivating both the university and the student to reduce these hours to zero. For these excess hours the student pays the standard tuition and fee rate. In addition, the student pays for the direct cost of instruction on a sliding scale that increases the student's cost as the number of excess hours increases.

For the first three excess hours beyond Degree Funded hours, the student pays 25% of the direct cost of instruction (about \$15 per credit hour) and the university pays 75% of the cost (about \$45 per credit hour). For the second three hours, the student pays half and the university pays half (\$30 per credit hour). With the third three hours of excess credit, the student pays 75% of the cost (\$45 per credit hour) and the university pays 25% (\$15). After nine excess hours, the student pays 100% of the direct cost of instruction or about \$60 per credit hour for all additional excess hours.

The university also must pay for all the other costs of instruction other than the direct costs for these excess hours, an amount of about \$90 per credit hour.

Degree program hours include all hours attempted, following the model of the state pre-paid tuition plan. Students can use AP, IB, CLEP hours for degree requirements but these hours do not affect Degree Funding hours. Military

Increase in Access with Degree Funding



Science and other hours not paid for by the state also do not affect Degree Funding hours. When students change majors, the number of Degree Funding hours changes only if the new major requires more hours than the previous major. All hours attempted count in a student's degree funding hours, regardless of the major under which they were attempted.

By reducing excess hours universities make possible an increase in access to public higher education, a goal of the SUS Master Plan and a high priority for the state. Access for a full-time-equivalent (FTE) student equals 40 credit hours. The number of individual student admissions made possible by this program

depends of course on how many hours each individual student takes each semester.

Incentives †

In determining our success, it is the faculty who provide the critical elements of talent, expertise, inspiration, and productivity. To succeed, we must focus considerable attention on the issue of faculty evaluation and reward. Effective evaluation produces the material for adequate reward, and universities require these mechanisms as much as any private sector enterprise.

Within the University of Florida, each department uses measures of quality performance to determine merit pay increases and to make merit pay decisions. In the case of research, we have nationally defined, well specified measures because the national and international market for research establishes these measures through competition. However, measures of quality and productivity for teaching have no national definitions nor did they have clearly defined local measures at the University of Florida. In response to this challenge, the University of Florida established a teaching improvement committee in 1992 that developed a protocol for defining and rewarding quality and productivity in teaching. This led to a proposal to the legislature and the funding of what we call the Teaching Improvement Program (TIP). The legislature adapted the TIP program and funded it for the entire State University System in 1993, and the

universities conferred the first awards in December 1993, consisting of \$5,000 base salary increases for 168 faculty at the University of Florida.

TIP essentially established an internal market for faculty productivity and quality in teaching. To participate in this marketplace, faculty had to satisfy a minimum productivity standard and then compete on quality to receive a TIP award. The productivity measure required that faculty must be above the median in their department or college in either student credit hours (the number of students taught) or contact hours (the number of hours spent in class) during the three years previous to the competition. Then, the quality measure required faculty to present evidence of the quality of their teaching in portfolios. For the first year of the program, only undergraduate teaching was considered; in subsequent years, both graduate and undergraduate teaching were included. For more information on this program see Ross et al. (1995). In the three years since the TIP program began, sections taught per faculty personyear have increased 4.6% while total credit hours per faculty personyear have increased 8.3%. In addition, the focus on defining quality classroom performance and quality instructional materials has led to a considerable interest in peer review of teaching, peer review of teaching materials, and a variety of teaching improvement programs sponsored by the various colleges.

† Ross, D. D., Barfield, C. S., Campbell, E. S., Capaldi, E. D., & Lombardi, J. V., "Teaching as a priority: A promising program at the University of Florida," College Teaching, 43 (1995), 134-139.

Research

If instruction represents one of the state's principal interests in university activity, research represents one of the university's most important products. The faculty, staff, and students of a major university participate in the process of discovery throughout their careers at the institutions. Undergraduate students receive the immediate benefit of research in the classroom as faculty transfer the results of their scholarship into relentlessly updated information and interpretation. Undergraduates also participate in the research process directly through laboratory and other research assistant assignments, and many undergraduates do independent research under the direction of a senior professor. Graduate students also participate directly in research as part of their program of education, working independently or in group projects with senior professors. However, the principal benefit of research is the advancement of knowledge that has and continues to lead inexorably to improvements in the quality of life and the vitality of our state and national economy. Research is the lifeblood of prosperity in our highly technology driven society. The solutions to our most pressing problems and the capture of our most promising opportunities require research for success.

The state of Florida supports two major types of research. The first takes place through the Institute for Food and Agricultural Science (IFAS) as part of the University of Florida's mission as a land-grant institution. IFAS pursues research with the direct purpose of enhancing the effectiveness and commercial viability of agriculture in Florida. The legislature funds IFAS' research mission directly and explicitly because it directly addresses the economic health of the state of Florida. This investment has, over the years, produced a substantial return to the citizens of the state by permitting the development of a wide range of Florida agricultural industries that would have been impossible without the research base of IFAS. Estimates vary, but something over 80% of the agricultural industry in Florida exists because of IFAS research and 92% of all crops grown in Florida are varieties developed by IFAS.

The second category of research takes place in all the other colleges of the university including the Health Sciences Center. This research varies from explorations at the outer edges of knowledge with not a glimmer of immediate practical benefit, as in the development of quantum theory that was necessary in order to develop lasers, to the most practical research on the strength of materials used in building roads, bridges, and schools. While the products of this research vary dramatically from the art exhibit to the specifications for concrete, we can find a variety of indexes to the productivity and quality of the research we do.

We first recognize that the teaching mission of the university requires that our faculty engage in research scholarship to maintain the currency of the expertise that underlies their instruction. This effort represents 10% of the total faculty effort and 4% of the state general revenue and lottery expenditures on research at the University of Florida. Scholarship of this variety does not necessarily produce publications, and faculty who engage in the research that supports teaching do not have an obligation to publish because the product of this research appears in the enhanced quality of their teaching and we evaluate this work through the quality evaluation of teaching.

For the rest of the research effort in this second category, however, we require publication. Publication takes many forms. It can involve an article in a journal, an exhibit in a gallery, a book for popular audiences, the award of a patent, or the appearance of a poem in a magazine. Whatever the form, publication represents the product of the research effort, and without a product there can be no contribution to our store of knowledge. A promising idea that never sees the light of day cannot be criticized and tested and cannot contribute to the national and international conversation that moves our understanding forward. Science, for example, that remains an unexpressed idea contributes nothing to the combination of ideas, experiments, and theories out of which come the cumulative improvements in our lives. So we demand that research, to be

considered research, must in a reasonable period of time produce a publication or a public expression of results that can be reviewed and understood by others.

Because research requires an investment of resources, we expect every faculty member engaged in research to seek outside sources of funds to support their research. In some fields, few sources exist for research support while in others, we find research dollars more available. In almost every field, our faculty compete against the best in the world to get these outside dollars, and so the amount of dollars earned serves as a rough approximation of the aggregate quality of the university's research enterprise. This is the measure used almost universally on a national scale to evaluate the research productivity of institutions.

The state of Florida invests a substantial number of state dollars in general research, and the best indicator of the university's effectiveness in using these dollars comes from the ratio of the state dollars invested directly in the university's general research to the outside dollars earned by university research. At the University of Florida we expect that in the aggregate this ratio will reach at least 3 to 1 for non-FAS research, that is 3 outside dollars earned for every 1 state dollar invested directly in general university research. This rough measure serves as a quick and effective reference for the university's aggregate research productivity although it does not serve as an effective management tool to distinguish research productivity among departments and colleges.

Performance Based Budgeting

Performance based budgeting provides a mechanism for public enterprises to connect their budgets to the performance of their mission. Public enterprises often have highly complex and diverse missions with multiple results and few public enterprises have the profit, return-on-investment measures or stock price and sales data that permit private enterprises to link their budgets to their performance. Higher education is no exception to this rule.

Higher education produces very complex goods, degrees for students and research products, that have values that extend well beyond the annual budget cycle. Research products often have no value in the year produced but tremendous economic value ten, fifteen, or twenty years beyond the date of their original production. Instructional products, delivered as degrees or courses or through public service or extension, often have a value that is not fully known for five to ten years at least beyond the date of delivery. Even more difficult to measure are the undeniable benefits that society receives from higher education whether in the form of generally higher standard of living or greatly enhanced economic opportunity for all members of society whether they attend the university or not. Thus, many efforts at performance based budgeting for universities fail in the effort to capture the full value of higher education in our complex society. We propose a much simpler method.

We should accept without question the proposition that higher education produces a very high value to American society and to the political subunits that support higher education in the states. Every economic analysis demonstrates the high rate of return to society from university education and every analysis demonstrates that economic development of states and regions depends first on the education level of its population and second on the ability of the society to translate that education into a highly motivated workforce. While economists may argue about the multipliers that translate a dollar invested in higher education into many dollars returned to individuals, industries, and society at large, no

one doubts the high rate of return. In any event, linking this high rate of return directly to university budgets works poorly, if at all, because of the complexity of the various interactions. If we agree on the value of higher education, then the critical issues for the state that pays a part of the cost of higher education relate less to the general return on investment--which is clearly high—and more to the performance of universities in using the state resources provided to support this vital enterprise.

We can calibrate university performance in the use of state dollars using a wide range of techniques and measurements. We can also invent a host of interesting and useful measurement techniques. In the end, we find that almost all of them express one or another dimension of the two fundamental activities of all universities: teaching and research. These two activities capture the main missions of the university. While modern universities often provide a wide range of services to their constituencies, most of these services simply extend either teaching or research capabilities into alternative areas, through alternative delivery systems, or focused on special subgroups within the general constituency for higher education. While a focus on teaching and research may obscure some subtle differences in the various activities of the university, this loss of detail permits an effective, simple, and practical performance based budgeting model for these public institutions.

This methodology operates in a manner similar to managed-care systems for delivering quality medical care at the lowest possible cost by guaranteeing health care coverage at a fixed price. This health care covers the life of the patient and places maximum emphasis on staying well and out of the hospital. It also, however, prescribes the levels of care available and the providers. If patients want additional care not provided for in the managed-care contract, they can always get it, but at an increased price. The performance based funding model proposed here operates in a similar way.

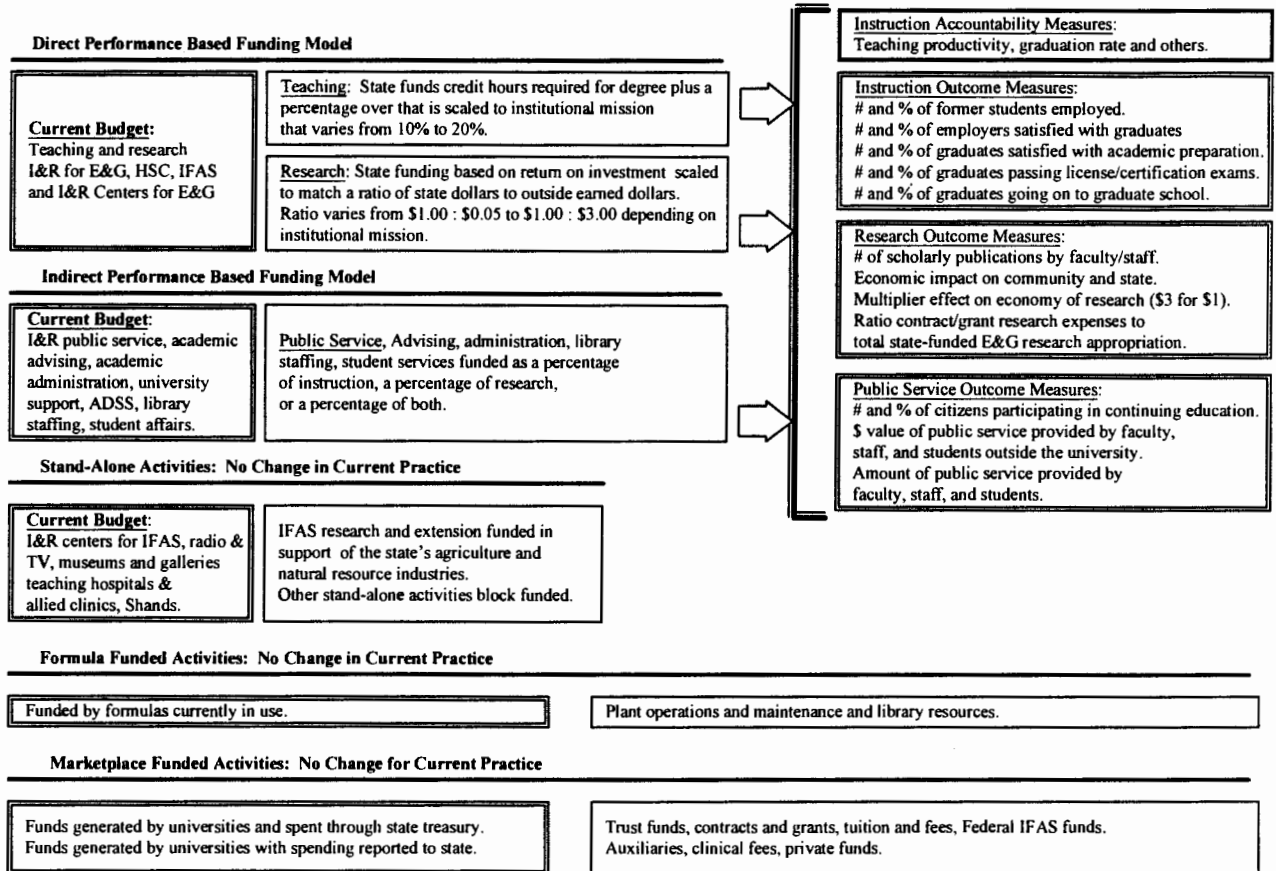
We ask the state to cover the educational requirements of a student's degree. The state provides sufficient funding and the student provides a co-payment for the degree requirement. If the student needs additional services beyond those in the state covered degree, the student and the university pay for the extra cost. This model has all the advantages as well as the disadvantages of managed care, but achieves the same results. It covers the educational needs of most students, and it provides strong incentives for both students and universities to operate efficiently. It provides universities with strong incentives to design student centered academic systems to ensure that students can complete their degrees within the funding provided.

As presented here, the method is also flexible enough to accommodate the different

missions and student profiles of the various universities by providing for different indexes for the instructional model (degree funding at 10% to 20% beyond degree requirements) and for the research model (state dollars to earned dollars at ratios of 1.00 : 0.05 to 1.00 : 3.00) much as physicians and hospitals have severity indexes to reflect different medical conditions.

The normal university accountability and outcome measures serve as quality control references to long and medium term results much as physician and hospital indexes of quality provide similar control references in the medical marketplace. These measures serve the consumer and the state as indicators of achievement and can show where special funding requirements may be needed and where Board of Regents quality review may be required.

PUBLIC UNIVERSITY FUNDING MODEL





Measuring University Performance: The Series

Issues I:1-II:4 August 1995-April 1996

The University of Florida series, *Measuring University Performance*, offers perspectives on important aspects of university activity and provides a useful reference for quantities of interest in the public debates about higher education in Florida and the United States. Each issue of *Measuring University Performance* highlights a topic, presents a discussion, and displays charts illustrating the various elements measured. In every case, an extensive data base underlies these reports, and we use these data for more detailed and specific management purposes within the university. Each report represents an effort to understand its topic and present it clearly, and over time, we expect to improve both the data that underlie these reports and the quality of their presentation. *Measuring University Performance* is one part of the University of Florida program known as the *Florida Quality Evaluation Project*.

Issued each month from the Office of Institutional Research at the University of Florida, the reports in *Measuring University Performance: The Series* are the work of that office's staff and are written by John V. Lombardi and Elizabeth D. Capaldi.

Measuring University Performance: The Series

<i>State Support</i>	Issue I:1	August 1, 1995	1
<i>Teaching</i>	Issue I:2	September 1, 1995.....	4
<i>Classrooms</i>	Issue I:3	October 1, 1995	7
<i>Research</i>	Issue I:4	November 1, 1995	10
<i>Excess Hours</i>	Issue I:5	December 1, 1995.....	13
<i>Transfer Students</i>	Issue II:1	January 1, 1996.....	16
<i>Research Benefits</i>	Issue II:2	February 1, 1996.....	19
<i>Student Quality</i>	Issue II:3	March 1, 1996.....	22
<i>Financial Aid</i>	Issue II:4	April 1, 1996	25



Measuring University Performance: State Support

Issue I:1 August 1, 1995

Introduction

Over the past few years, the University of Florida, as well as the other public universities in the state, has adjusted remarkably to the dramatic decline in state support for higher education. As the state shifted its priorities, the dollars available to provide quality higher education to its citizens declined. In response, each public university fine tuned its programs and activities. To meet its obligation to educate Florida's citizens, each university launched a major effort to improve productivity to continue to meet these needs in the face of reduced support from the state.

To succeed in this effort, we require good data that reflect the dimensions of our financial dilemma and at the same time measure the results of our programs to improve productivity. This is the first in a series of reports to the Board of Regents that governs the University of Florida and each of the other public universities in the state. This series, *Measuring University Performance*, offers us the opportunity to explain the complex set of resources that supports quality at the University of Florida that, in turn, contributes to the economic prosperity of this state and its citizens.

Each installment in this series will focus on one dimension of the university's performance, identifying key elements in our changing resource base and illustrating our response to these changes. This installment, *Measuring University Performance: State Support*, speaks to the adjustments now occurring as a result of the dramatic decline in state funding and the increasing state focus on instruction. For the University of Florida, these are difficult issues, because our commitment to undergraduate

education is very strong but our mission also requires us to support graduate and professional instruction and to focus intensively on research. Our faculty, staff, and students have responded to the challenges of these issues with considerable imagination. They developed a Teaching Improvement Program, which placed clear incentives on teaching quality and productivity. They invented a University Center for Excellence in Teaching, secured outside funding from IBM and established a writing laboratory for undergraduates. They created a nationally recognized undergraduate student advising system and devised an accurate means of measuring student programmatic efficiency. They also began a series of changes and reviews of the structure of the undergraduate curriculum.

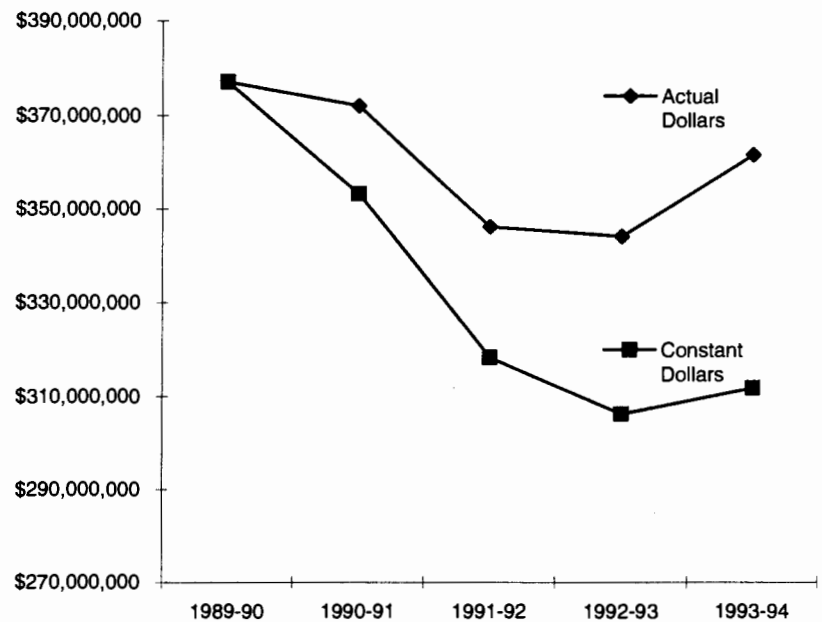
Many of these responses have won the support of the Board of Regents and others have found constituencies in the legislature. Most importantly, however, together these responses form a consistent and coherent design for the improvement of quality and productivity in undergraduate instruction. The changes begun with these programs have had only a few years to produce benefits. The next issue of this series will show indicators of the resulting improvements.

The charts in this issue highlight some of the modifications of the underlying resources. Data for public universities, while valid and detailed, are often cumbersome to analyze. Consequently, the task of translating these data for analytical purposes has been an adventure in and of itself. The Florida Quality Evaluation Project provides the basic structure for this process, although some of the data included in this series go well beyond that project.

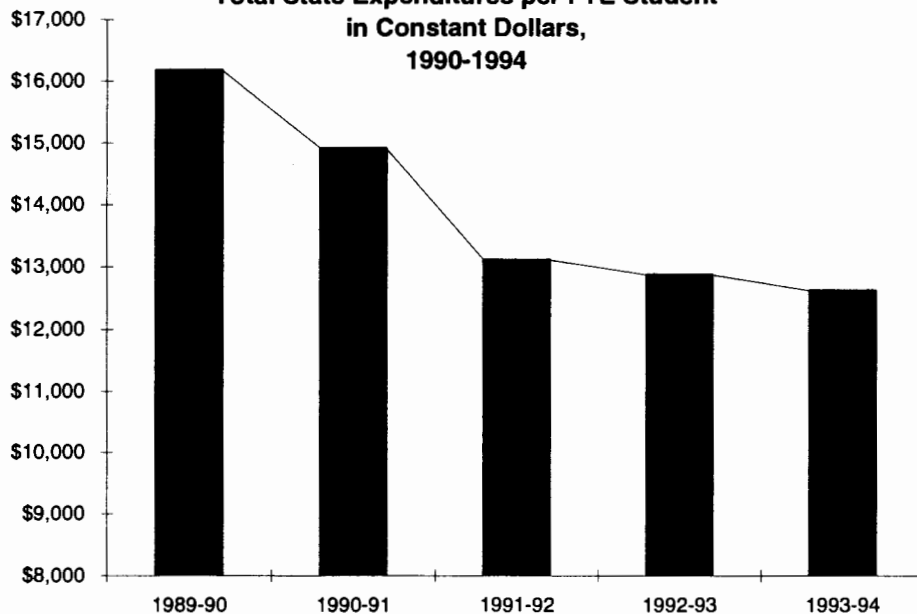
STATE DOLLARS

The University of Florida suffered a dramatic decline in state expenditures during fiscal years 1990, 1991, 1992, 1993, and 1994. The decline in constant dollars represents the loss of purchasing power for the university during these five years, with the lowest point in fiscal year 1993. Over these five years the University of Florida lost more than \$65 million in purchasing power from its state support. For these calculations we used the Higher Education Price Index, a national index prepared by the National Center for Education Statistics, U. S. Department of Education, to reflect the impact on the costs associated with operating institutions of higher education.

**State Expenditures in Actual and Constant Dollars
(General Revenue and Lottery 1990-1994)**



**Total State Expenditures per FTE Student
in Constant Dollars,
1990-1994**



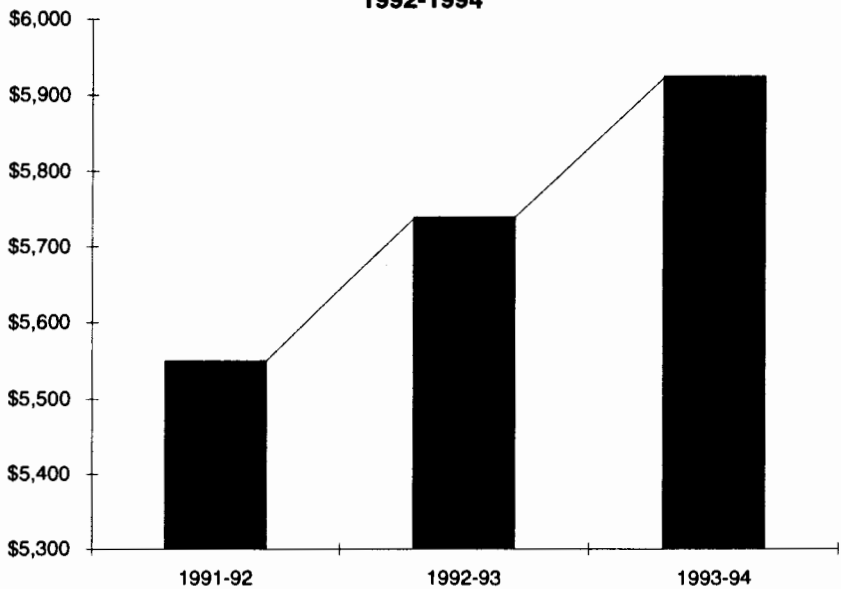
STATE DOLLARS PER STUDENT

The decline in total state expenditure accompanies an increase in number of students. Clearly the state spends less per full-time-equivalent student. This comparison includes all students (undergraduate, professional, and graduate/Ph.D.) and all state general revenue and lottery funds. As the state's support for all university functions declined, the university's support and administrative base also declined, since more and more of the funds went to direct instructional expenses.

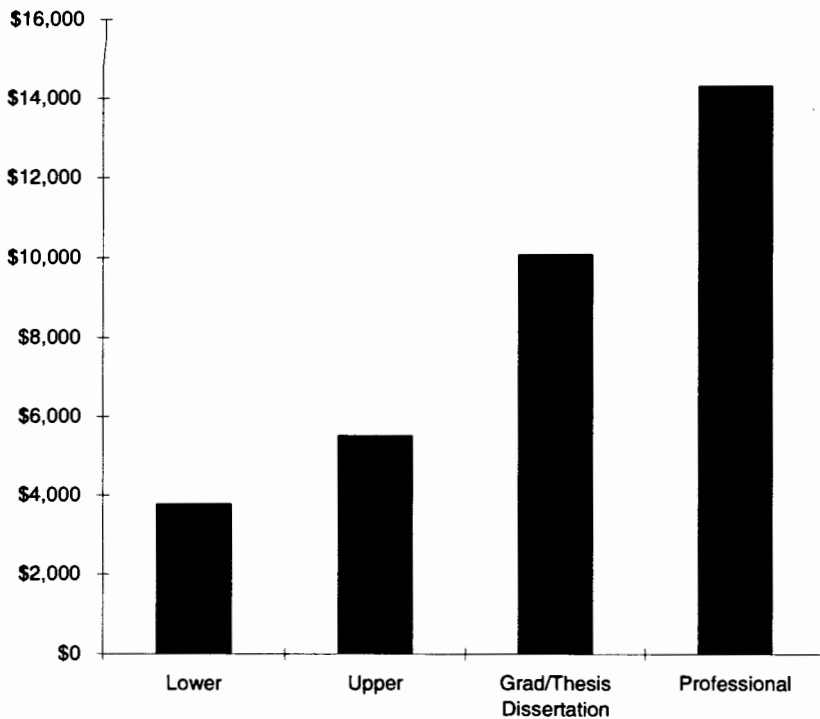
STATE DOLLARS FOR INSTRUCTION

As total state dollars invested per student declined, state dollars invested in teaching per student increased (we include direct instructional expenditures and support expenditures). This responds in part to a legislative shift of state funds. Retreating from the support of the university's threefold mission of teaching, research, and service, the state transferred dollars from these areas to support instructional costs. The university also shifted resources internally from research and administration to teaching.

State Instructional Expenditures per FTE Student in Constant Dollars, All Levels 1992-1994



State Instructional Expenses per FTE Student by Level in 1993-94 dollars



COST BY LEVEL OF INSTRUCTION

The relative expenditures at each level of instruction have remained stable. Clearly, the cost of the undergraduate lower level comes from the efficiencies of larger introductory classes, and the higher cost of upper-level instruction reflects both smaller classes and the higher cost of operating laboratories and other specialized teaching environments. Graduate classroom and thesis/dissertation instruction tends to be expensive with small class sizes and many specialized teaching requirements. Professional courses are the most expensive. Many professional programs have restrictions on class size and other requirements placed on them by accreditation criteria that raise the cost of instruction.



Measuring University Performance: Teaching

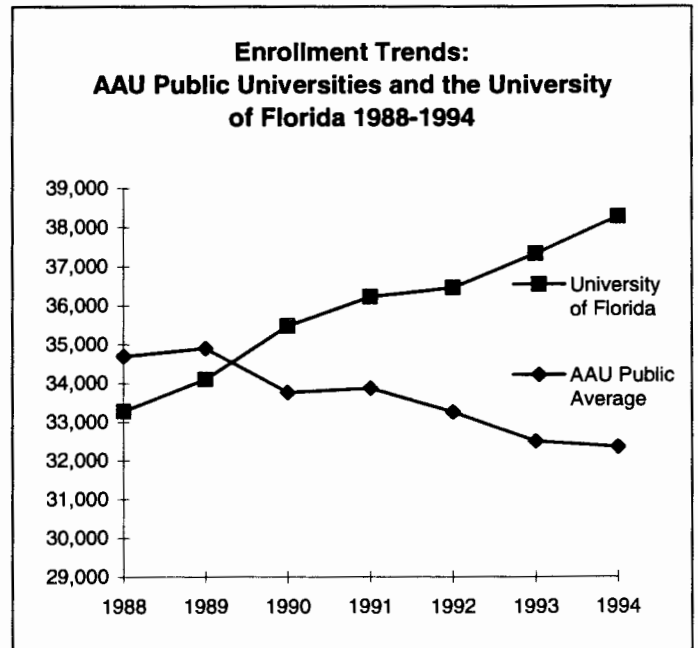
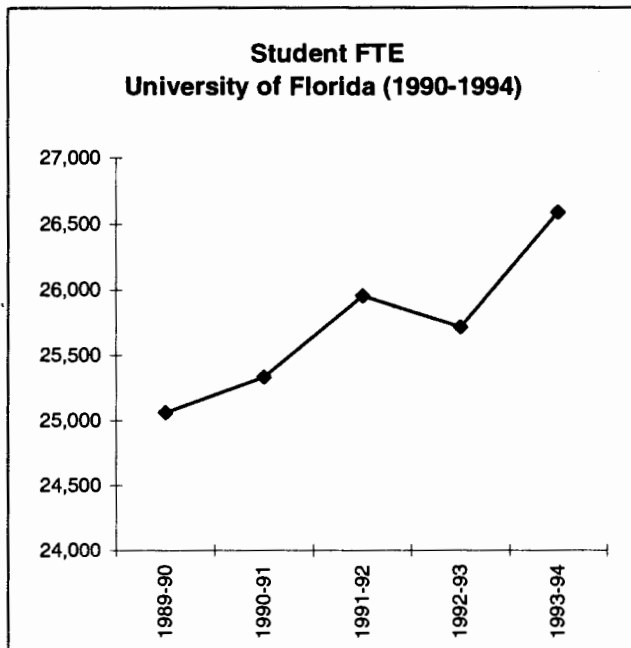
Issue I:2 September 1, 1995

Summary

In the past few years, the University of Florida has placed a significant emphasis on the faculty's productivity and quality in teaching. This has included programs to improve quality through peer review and a major program funded by the state legislature that rewards faculty with base salary increases for excellent performance in the quality and productivity of their teaching over a period of years. These initiatives plus the continuing commitment of the faculty to the improvement of the university's degree programs have produced exemplary results, some of which are illustrated in these charts.

While we pursue the quality and productivity of our undergraduate teaching with great enthusiasm and conviction we also must continue the strong tradition of research growth that has characterized this university for the past decade or more. On some dimensions we do well at this activity, as reflected in the growth of sponsored research expenditures, but on others we lag behind our peers, such as the number of Ph.D. degrees relative to the number of bachelor's degrees.

The following charts provide a clear indication of our success and of the areas requiring continued improvement.



Degrees Awarded

As enrollment grew throughout the six years represented on the chart on this page, so too did the production of degrees of all types from bachelors of arts and science through masters and specialists degrees to professional and Ph.D. degrees. The university's instructional mission, while often measured in terms of credit hours and programs and student FTE, produces its major benefit when it graduates a student prepared through a defined program of academic study represented by an academic degree. From our perspective, the degree awarded is the clearest measure of teaching achievement.

However, while we have seen the degree total rise along with the total enrollment, we also must compare our degree productivity with our counterpart institutions. Clearly we fit reasonably well into the AAU public university profile for total bachelors degrees awarded. However, our Ph.D. total is low relative to our counterparts and the relative emphasis on Ph.D. degrees expressed

as a percentage of bachelors degrees is also low. These data indicate the different structure of the academic programs of these universities. Florida has very inexpensive undergraduate tuition and thus attracts a high quality student body with a relatively low requirement for financial aid.

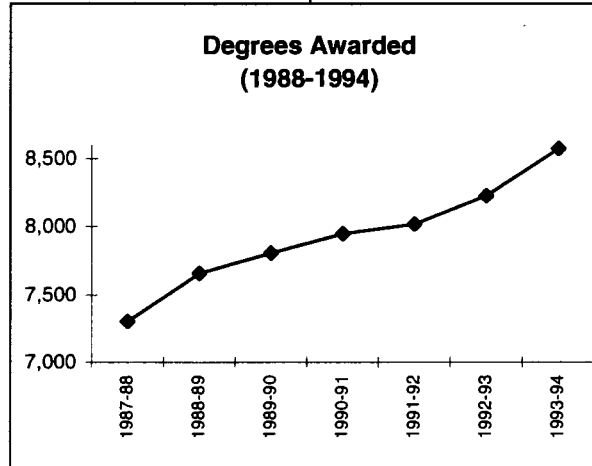
However, Ph.D. level instruction among AAU public universities depends very heavily on the

availability of financial aid, and graduate students select institutions not only on their academic research quality but also on the availability of financial aid.

There is also a time lag between the creation of quality research programs as reflected in sponsored research expenditures and the movement of Ph.D. students into those fields.

In many cases, University

of Florida Ph.D. programs have produced advanced degrees for relatively few years. Nonetheless, these data indicate that the institution must invest more effectively in the development of its Ph.D. programs if it is to compete successfully in its peer group.



AAU Public University	Bachelors Degrees	AAU Public University	Ph.D. Degrees	AAU Public University	Ph.D. as % of Bachelors
1 Penn State	8,040	1 UC, Berkeley	806	1 UC, Berkeley	14.0%
2 Texas	7,497	2 Illinois	706	2 Minnesota	12.1%
3 Ohio State	7,182	3 Texas	694	3 Illinois	11.7%
4 Washington	6,103	4 Ohio State	683	4 UCLA	11.7%
5 Illinois	6,026	5 Wisconsin	674	5 Wisconsin	11.6%
6 Wisconsin	5,827	6 UCLA	655	6 Virginia	11.2%
7 UC, Berkeley	5,740	7 Minnesota	628	7 UNC, Chapel Hill	10.7%
8 UCLA	5,622	8 Penn State	511	8 Pittsburgh	10.5%
9 FLORIDA	5,533	9 Purdue	503	9 SUNY, Buffalo	10.0%
10 Purdue	5,469	10 Maryland	486	10 Maryland	9.5%
11 Rutgers	5,225	11 Washington	415	11 Ohio State	9.5%
12 Minnesota	5,209	12 UNC-Chapel Hill	388	12 Iowa	9.4%
13 Indiana	5,206	13 FLORIDA	372	13 Texas	9.3%
14 Maryland	5,097	14 Indiana	365	14 Purdue	9.2%
15 Colorado	4,429	15 Colorado	358	15 Iowa State	8.2%
16 Iowa State	3,938	16 Rutgers	349	16 Colorado	8.1%
17 UNC, Chapel Hill	3,610	17 Iowa	334	17 Indiana	7.0%
18 Iowa	3,542	18 Pittsburgh	332	18 Washington	6.8%
19 SUNY, Buffalo	3,227	19 Iowa State	322	19 FLORIDA	6.7%
20 Pittsburgh	3,170	20 SUNY, Buffalo	322	20 Rutgers	6.7%
21 Virginia	2,808	21 Virginia	314	21 Penn State	6.4%

Faculty Productivity

The faculty provide the intellectual energy and productivity that results in teaching and research. As budgets tighten and many of our external constituencies focus on the productivity in teaching, we must ensure that we maintain quality of teaching and sustain the research productivity that is the hallmark of a major research university like the University of Florida.

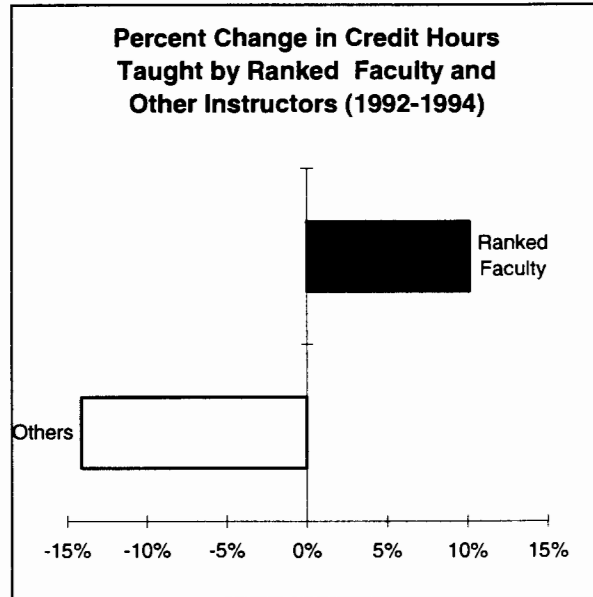
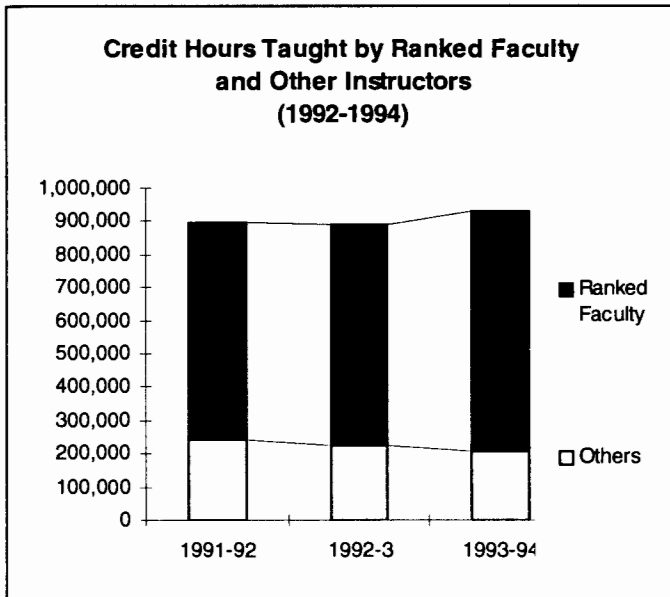
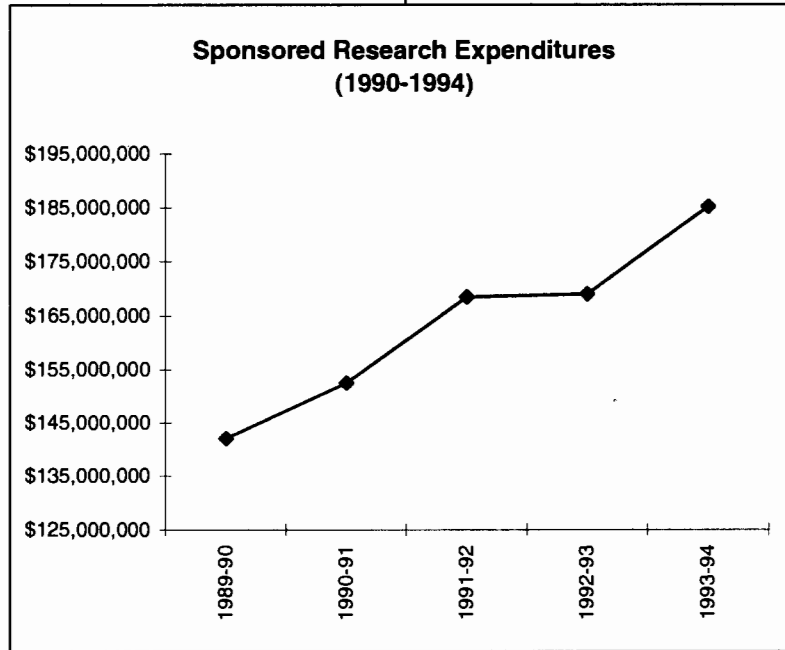
While direct measures of faculty productivity may elude us, the proportion of teaching done by the ranked faculty indicates the focus on quality by our most qualified teachers. In the charts below, the proportion of teaching done by ranked faculty has increased as the proportion done by other faculty, principally teaching assistants, has decreased. The shift to ranked faculty is even greater than outlined here,

of course, because the number of credit hours taught has also increased dramatically.

As the chart below indicates, we have simultaneously continued the decade long trend toward increasing sponsored research expenditures. Sponsored research expenditures is the only fully reliable indicator of the research intensity of the faculty as it reflects the actual

expenditures of funds secured from outside sources on research. Other important research does not appear here such as art, humanities, and social science or professional school work done without special outside funding, but nationally we all use sponsored research expenditures as the best indicator of research

commitment even though it is not complete. Research enhances the quality of both undergraduate and graduate teaching.





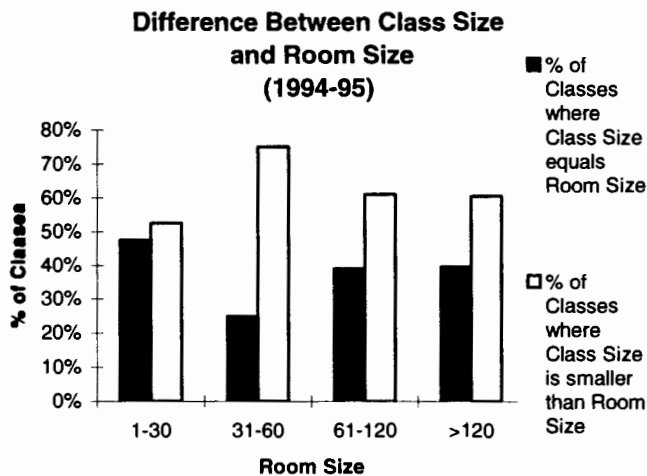
Measuring University Performance: Classrooms

Issue I:3 October 1, 1995

Summary

Classroom utilization represents the efficiency of the university in using every seat physically available to teach classes. However, the goal of efficiency of classroom use and the goal of reasonably small classes conflict. The university's classrooms, built to various sizes, do not exactly match the optimal size of classes. At some times of the day rooms are too small for some of the classes and at other times rooms are too large. Optimal filling of classrooms would certainly defeat the goal of maintaining a substantial proportion of classes at relatively small size. The faculty have developed rather clear expectations about class size. Some instruction, beginning foreign language, writing classes, some mathematics classes, must be taught in small groups for effective instruction. Other classes, large survey lectures and similar foundation courses, work exceedingly well with

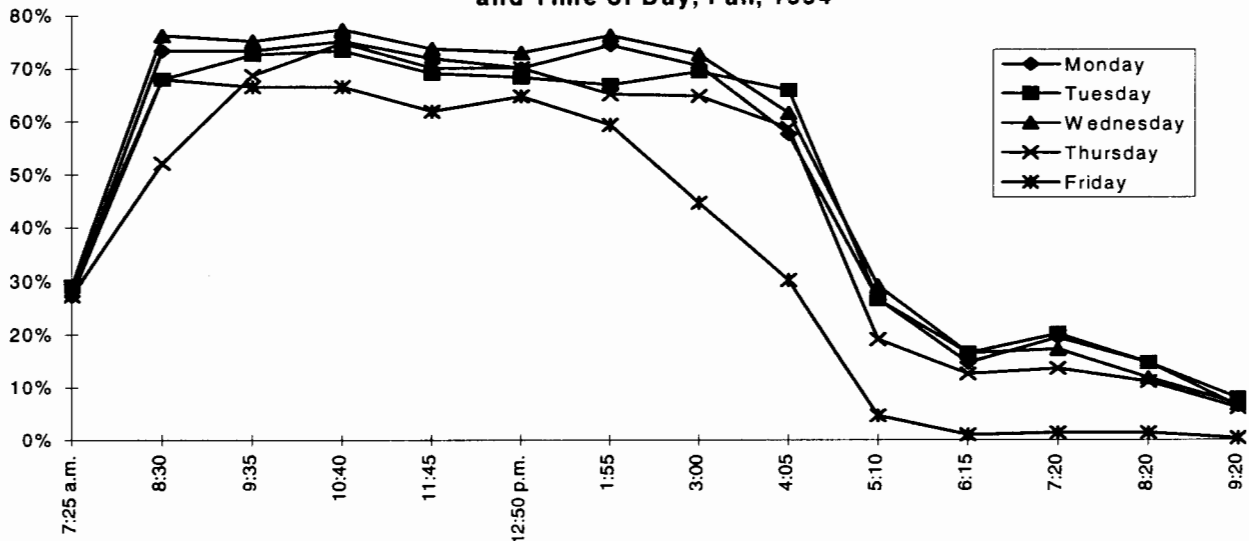
lower division courses such as music and art appreciation. Other classes combine large lecture sessions with small discussion sections or laboratories. With the advent of varieties of alternative technologies, television, distance education, and the like, the correspondence between the physical room size and the actual enrolled class size will become increasingly irrelevant as distance education reaches large numbers of remote students, many of whom will learn at different times and locations. The following charts illustrate some elements of classroom utilization and class size. These data help us understand how the university uses its space and where we can recapture some space for additional use. Overall, this analysis shows the university reaching a limit in its ability to provide additional classrooms, especially for classes of small to medium size.



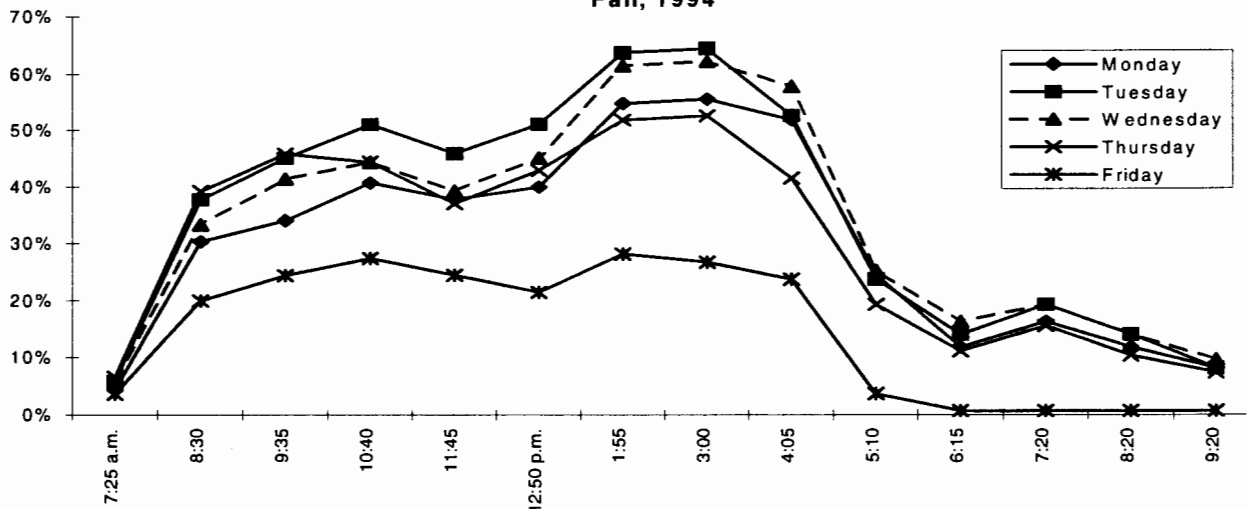
This chart illustrates the difficulty of matching inflexible room sizes with classes of different sizes. Small classes take place about half the time in rooms of the right size and about half the time in rooms that are too big. The classes of medium size, from 31 to 120 students are more likely to take place in classrooms that have more seats than needed, and even in our larger classes of 120 or more, about 60 percent of them are in rooms larger than needed. This, of course, comes from the fact that rooms are often at 150 or 200 or even 400 seats but the class is scaled for a smaller size. These data indicate that the university can increase its enrollment and classroom utilization, but only at the expense of increasing class size to fully fill the available physical seats.

As we look at classroom use, we also need to see how well we use the space available on a day to day basis throughout the week. This chart shows the percent occupancy of classrooms by the day of the week and the time of day. Clearly the university reaches rather full occupancy by 8 a.m. on most days and stays level until after 4 p.m. After a short lull that coincides with the dinner hour, occupancy rises for the night classes after 7 p.m. and then tapers off by 9 p.m. This pattern is typical for a residential, full-time student campus. Higher occupancy of classrooms is difficult to achieve because of conflicts that arise in an individual full-time student's schedule. Parents and students both resist night-time classes, although as enrollment rises and scheduling conflicts become more difficult to resolve, we have seen an increase in night-time studies. If the university is to expand its night-time schedules it will have to address the issues of lighting, parking, and security in much greater depth than it does today. Although Friday classes are slightly less prevalent than the Monday through Thursday schedule, this reflects the pattern of classes that have regularly scheduled meetings on Monday and Wednesday with discussion sections and laboratories scheduled at many different times throughout the week. The laboratory schedule reflected in the second chart does not quite match the classroom schedule shown in the first chart. Labs are predominantly scheduled in the afternoon, peaking at about 3 p.m., and are mostly scheduled Monday through Thursday. Partly this is the natural tendency to cluster scheduled activities over the first part of the week and partly it is the result of leaving Friday more open for laboratory set ups, clean-up, and other maintenance chores.

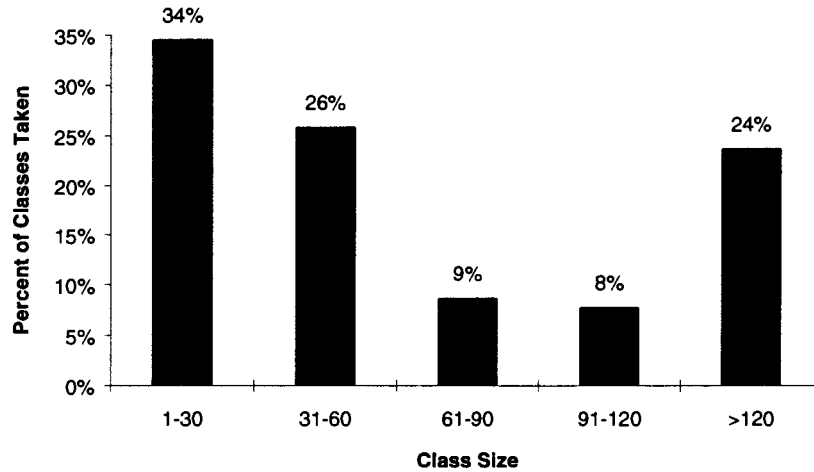
Classroom Utilization by Day of Week and Time of Day, Fall, 1994



Lab Utilization by Day of Week and Time of Day, Fall, 1994



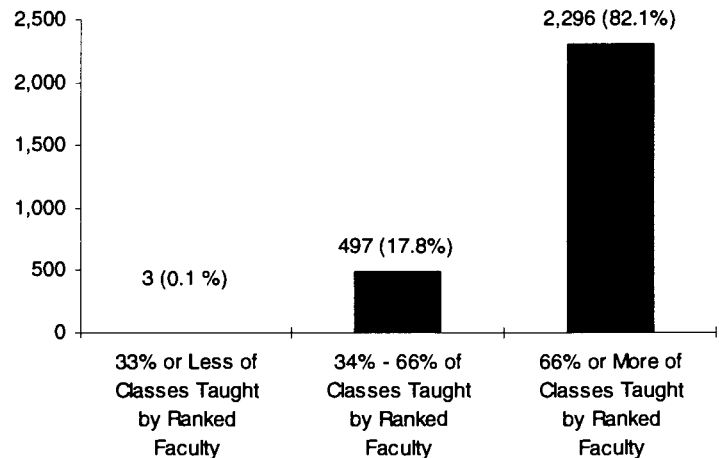
**Percent Classes Taken by Graduating Seniors
by Class Size, Spring, 1995**



Parents and students often wonder about the percentage of large and small classes likely to be taken during a college career. This chart illustrates the percentage of classes of various sizes taken by the graduating class of Spring, 1995. As indicated in these data, most classes are either relatively small, under 61 students (about 60%) or are relatively large, over 120 students (about 24%). A few are in the middle between 61 and 120 students, (17%). Another way to express this is to recognize that about 77% of the classes taken by the graduating students fell below 120 students. Very large classes are relatively few, if only because there are very few classrooms on campus over 150 to 200 seats.

Most of the graduates in the Spring, 1995 class had the majority of their classes taught by ranked faculty. A few students, about 3 out of this class of almost 3,000, had a third or less of their classes taught by ranked faculty. Another 18% had between a third and two-thirds of their classes taught by ranked faculty. Most of the class, some 82%, had two-thirds or more of their classes taught by ranked faculty. These data include all sections, including lab sections, discussion sections, and other attached sections taught by teaching assistants as part of a course taught by ranked faculty. If we had been able to separate the classes from the support sections, an even higher percentage than the 82% would have had over two thirds of their classes taught by ranked faculty.

**Number of Graduates Showing Percentage of
Classes Taught by Ranked Faculty
(Spring 1995 Undergraduate Class)**



Measuring University Performance: Research

Issue I:4 November 1, 1995

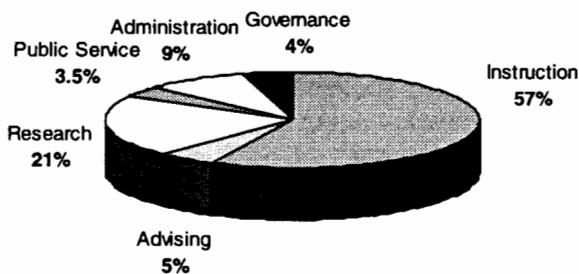
Summary

Research represents one of the university's most important products. The faculty, staff, and students of a major university participate in the process of discovery throughout their careers at the institution. Undergraduate students receive the immediate benefit of research in the classroom as faculty transfer the results of their scholarship into relentlessly updated information and interpretation. Undergraduates also participate in the research process directly through laboratory and other research assistant assignments, and many undergraduates do independent research under the direction of a senior professor. Graduate students also participate directly in research as part of their program of education, working independently or in groups or projects with senior professors.

Throughout, the research staff of the university contribute expertise, skills, and support to this enterprise. In the following charts we identify some rough measures of the state funded effort of the ranked faculty that drives the research program. State funded effort is the state investment in the university's research mission. A rough indicator of

its productivity for publication oriented research lies in the outside dollars earned relative to state dollars spent. This measure is hardly all inclusive but it correlates well with other less easily obtained data on research results in major universities. About 10% of ranked faculty research time focuses on the scholarship that underlies teaching and produces better instruction for students at all levels from undergraduate through professional and graduate study, but does not produce publications or grants. Finally, patents and royalties provide an indicator of the university's effectiveness in transferring the results of research into the state and national economy. The university reinvests its share of these self-generated funds into further research. Overall, research is a major engine of economic development. Every 1 dollar of research funding spent (from whatever source) produces 3 dollars in economic impact to the community or state. Each million dollars of R&D spending produces just over 33 jobs. The University of Florida generates close to \$200 million in research expenditures or 6,600 jobs a year. Research is a very good state investment.

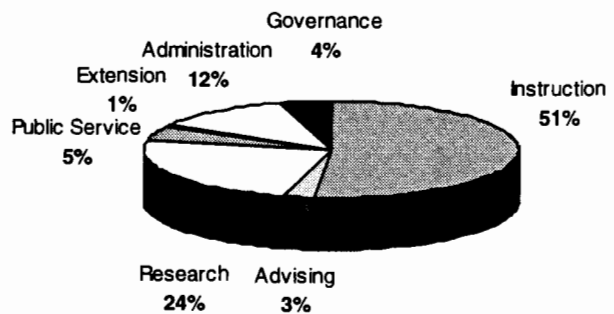
**State Funded Ranked Faculty Effort
E&G 1993-94**



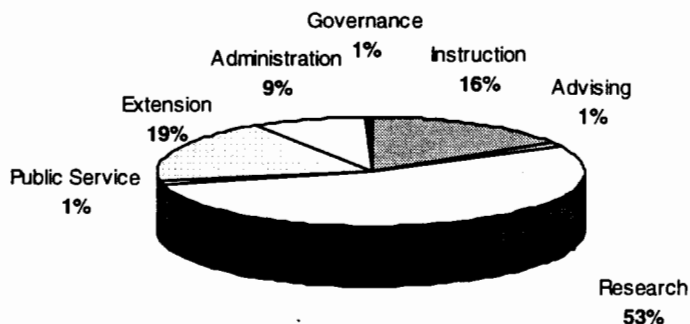
The state provides dollars for faculty to perform a variety of functions. As this chart shows, for the core colleges of the university, all but the health sciences and agriculture, faculty spend almost two thirds of their time (62%) on direct student activities in teaching and advising. Research time falls into two categories: the 10% required for instructional scholarship and the remaining 11% of publication oriented research. Public service and governance, while lower in faculty effort at a total of 7.5% nonetheless require careful evaluation to determine whether some of this effort could contribute to research or instruction. Academic administration at less than 10% is about right by most standards.

The colleges of the Health Sciences Center support a substantially higher percentage of graduate and professional students than do the E&G colleges. As we would expect, they have slightly less state funded effort spent on the direct student activities of advising and teaching and slightly more time spent on publications oriented research (14%) after deducting the instructionally required research of 10%. Of more concern is the administrative investment of faculty time at 12% and the combined public service and governance commitment of 9%. However, the very large volume of outside dollars generated in research and clinical care make direct comparisons with the E&G colleges or IFAS difficult at best.

**State Funded Ranked Faculty Effort
Health Sciences Center 1993-94**



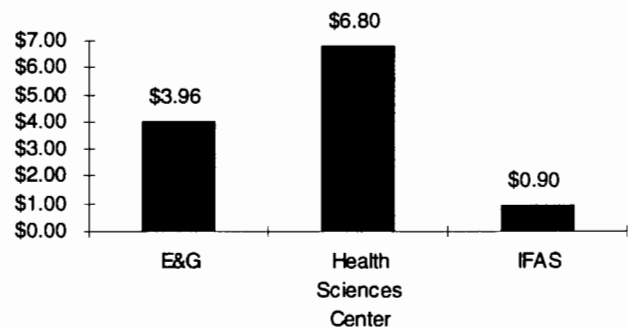
**State Funded Ranked Faculty Effort
IFAS 1993-94**



IFAS, with its mission of direct support of Florida agriculture through extensive on-campus research and state wide research and education center programs, shows a much different use of state funded ranked faculty effort. Over half the IFAS faculty's effort delivers mission specific research to Florida's agricultural industries along with the 10% required to support the growing instructional program and extension. IFAS faculty spend about 17% of their state funded effort on direct student teaching and advising. Academic administration is below 10% and the governance and public service investment is low. IFAS's special mission as a land-grant institution requires this focus on direct agricultural research. Continuing internal review within IFAS may lead to reallocations between extension and research to meet changing needs in the state.

We measure the return on the state's investment in research by calculating the sponsored research dollars generated for each state dollar spent on research. We expect a major research university to generate at least 3 sponsored research dollars from outside the institution for every state dollar spent on publication oriented research by the ranked faculty. After taking out the 10% of state dollars invested in the scholarship that supports teaching, the core colleges in E&G return almost 4 dollars for every state dollar invested and the health sciences colleges return almost 7 dollars for every state dollar invested. IFAS, with its specific state mission in support of agriculture does not pursue externally funded grants and contracts at the same level. Nonetheless, even IFAS returns almost one externally funded dollar for every state dollar invested. State funded research is clearly a very good investment.

**Sponsored Research Dollars Generated
per State Dollar Invested in Research
Over 10% Needed for Instruction (1993-94)**



**U.S. Patents Awarded in 1993
Top 10 Universities
(Public & Private)**

<u>Rank</u>		<u>Patents Issued</u>
1	Massachusetts Institute of Technology	92
2	Wisconsin Alumni Research Foundation	51
3	University of Florida	45
4	Stanford University	39
5	Johns Hopkins University	32
6	State Univ. of New York Research Foundation	31
7	University of Minnesota	30
8	Columbia University	29
9	University of Pennsylvania	28
10	North Carolina State University	24

[NOTE: The University of California System is omitted from these rankings; only individual universities are included.]

**Top Ten AAU Public Universities
1993 Royalty Income**

<u>Rank</u>		<u>Royalty Income</u>
1	Wisconsin Alumni Research Foundation	\$15,822,400
2	University of Washington	\$14,755,000
3	Michigan State University	\$14,150,029
4	Iowa State University	\$11,600,000
5	University of Florida	\$5,666,412
6	University of Virginia Patents Foundation	\$3,538,382
7	Rutgers, State University of NJ	\$2,419,706
8	University of Colorado	\$1,272,764
9	University of Michigan	\$1,245,000
10	University of Minnesota	\$1,162,892

The research effort of the ranked faculty also produces patents. The number of patents awarded serves as a very rough indicator of the university's commitment to protecting the intellectual property developed with state, federal, and private funds and reflects an active program to translate research products into commercial activity to benefit the people and economic development of the state and the nation. The total number of patents also provides an index to the level of scientific activity. This measure, along with the others in this report does not, however, capture the work of faculty in the fine arts, humanities and social sciences whose work may well produce major contributions enjoyed by and benefiting many citizens. Books, plays, sculpture, music, all represent publication oriented research of the ranked faculty even though this production does not appear here. Consequently these data are only an indicator of activity and most certainly underestimate the research productivity of the faculty.

Royalty income indicates the success of the university in transferring its technology into the marketplace. Most patents produce very small amounts of money, and a few discoveries produce a significant return to the university. The time lag between a patent award and a return of revenue to the university is very long, 15 to 20 years in many cases. From time to time a university succeeds in a major way as we did with Gatorade which produces about 83% of the revenue from royalties. The commitment to bring scientific discoveries to market is a critical dimension of research productivity and royalty income is a useful if imperfect measure.

Another, less statistically malleable, measure of research achievement is the individual awards of the faculty. The following provide a general indication of some of the national recognition received by the university's faculty. Many other awards and honors of the faculty, staff, and students reflect particular excellence in one or another field, but space permits only the summary recorded here:

NSF Young Investigator Awards (now called Faculty Early CAREER Awards)

- The university has 18 faculty currently working on projects sponsored under this highly competitive program

Guggenheim Fellowship Awards

- The university has 10 faculty who have received Guggenheim fellowships during the past ten years.

National Academy of Engineering

- The university has 9 members in the National Academy of Engineering

National Academy of Sciences

- The university has 9 members in the National Academy of Sciences

Institute of Medicine of the National Academy of Sciences

- The university has 3 members in the Institute of Medicine



Measuring University Performance: Excess Hours

Issue I:5 December 1, 1995

Summary

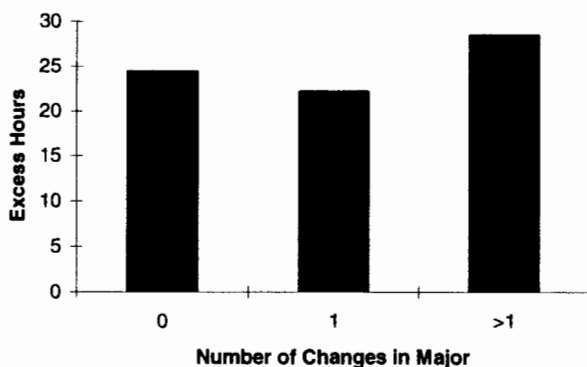
Over the past several years the legislature, Board of Regents and universities have worked on a variety of programs to improve the efficiency and accountability of university education. These efforts have as their goal the improvement of a student-centered undergraduate program in our universities. The critical analysis in this effort gave us an understanding of the total number of credit hours required for a degree compared to the total number of credit hours taken for a degree. This credit hours-to-degree, shows that the average UF student takes about 24 credit hours beyond those required for the final degree. The aim of our analysis is to facilitate students' progress toward degrees by removing barriers that are the responsibility of the university. Analysis of the data for the Spring 1995 graduating class revealed one source of excess hours was an inability to obtain basic courses in English at the time they were needed. Students who cannot obtain needed classes often register for unneeded classes in order to keep their financial aid. With help from the legislature this year we removed that barrier to the degree by offering 2739 more seats of English. The benefits of this were seen immediately in satisfied students who obtained a needed course, and benefits for

the state will be seen when these students graduate with fewer excess hours.

The data and charts presented here indicate that about half of the 24 excess hours could be eliminated by better management of the student's progress through the university. Some of the remaining excess hours are a necessary cost of students' exploration of alternative degree paths, while other hours, due to students dropping, repeating or failing courses may be susceptible to management. The reduction of excess hours is a university-wide responsibility. Excess hours cannot be measured meaningfully by college because students transfer from college to college and the university does not want to discourage colleges from accepting students who have taken a while to discover their appropriate major and thus will graduate with excess hours.

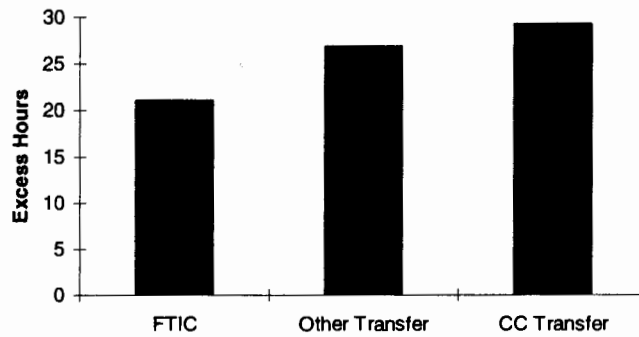
The charts here include baccalaureate degree recipients in Spring 1995 (2556 students) who received one degree with one major and had no previous baccalaureate degrees. This is the pool of students in the Board of Regents accountability plan. These data have been audited and their accuracy verified. There is also one chart showing excess hours for the students who had two majors or received two degrees.

Excess Hours as a Function of Number of Changes in Major



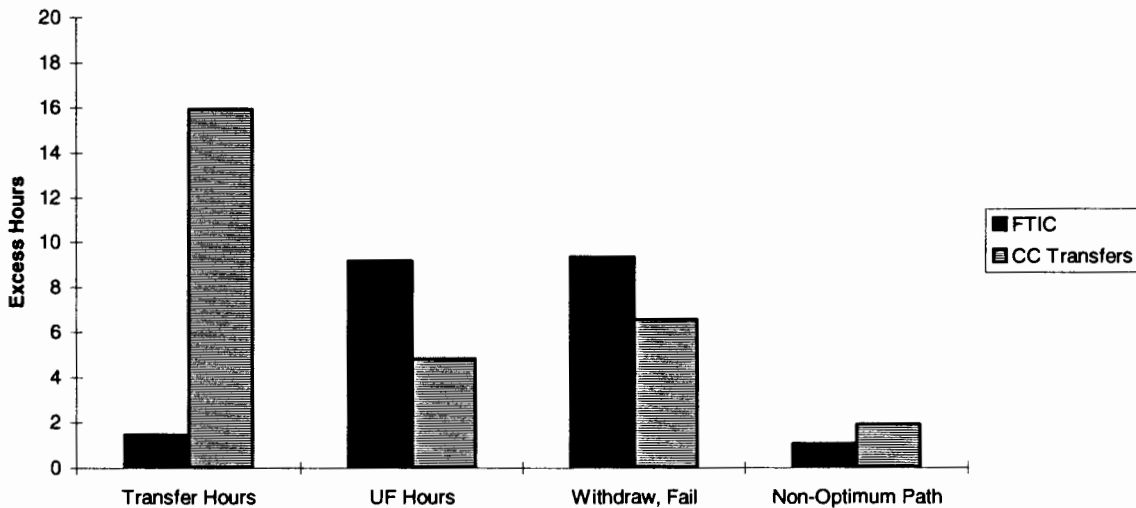
This chart illustrates the effect of changing majors on excess hours. About 80% of the students did not change majors or changed majors only once. Students who changed majors once actually took fewer excess hours (by two) than those who changed not at all. For last year's class (Spring 1994) this difference was in the opposite direction, with one change in major adding two credit hours. Both years the difference between changing majors once and not at all was only two credit hours. Clearly changing majors once is not an issue in excess credit hours. Students who changed majors more than once took 28 excess hours, 4 more than those who changed majors not at all.

Total Excess Hours as a Function of Student Classification



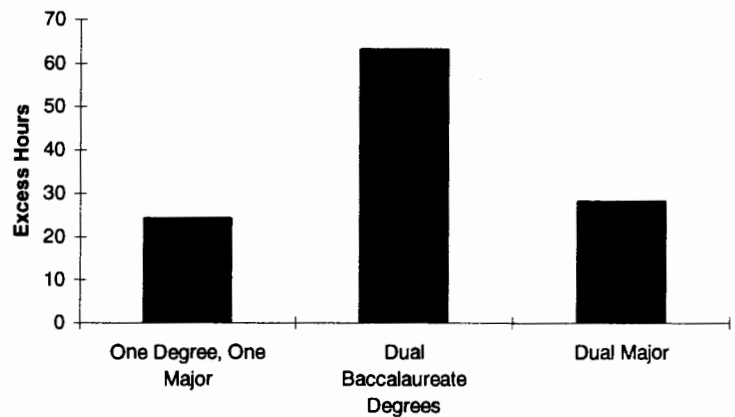
Students who began at UF took on average 21 excess hours while community college transfer students averaged 29 excess hours. This difference was in the same direction for last year's graduating class, but the difference was smaller. The source of the excess hours differs for transfer students and students beginning at UF, as shown in the chart below, with most of the excess hours for transfer students being hours taken elsewhere that were not used for the UF degree. Clearly there is room for improved articulation. The largest source of excess hours for students beginning at UF is courses dropped (only courses dropped after the drop/add period are included in the analysis) or failed. Part of this overage may be susceptible to management by better advising and part may not. The excess hours that are labeled in the chart non-optimum path are hours a student took that fulfilled a requirement that could have been fulfilled by taking fewer hours. This source of excess hours should be reducible by better advising.

Excess Hours as a Function of Student Classification and Source of Hours

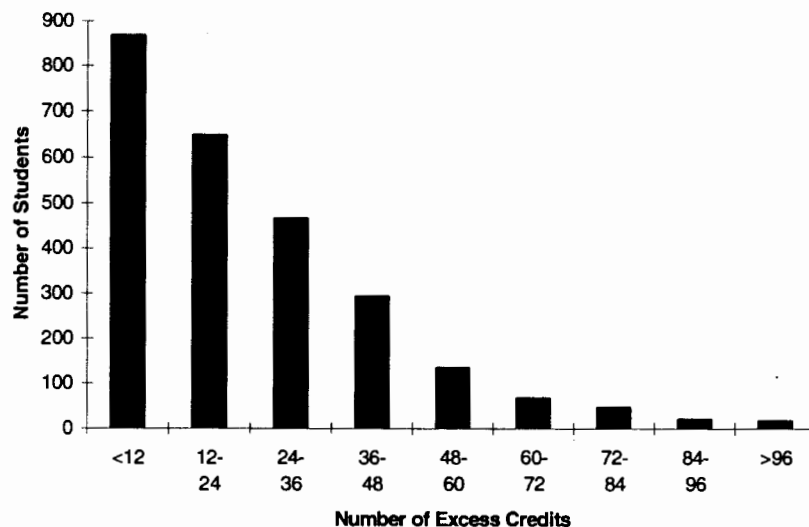


This chart shows the effects of double majoring or fulfilling the requirements for two baccalaureate degrees. In the graduating class of Spring 1995 only 25 students had a double major, and these students took on average 28 extra hours, only 4 more than students with one major. The 20 students who received dual degrees however, took on average 63 extra credit hours, almost 40 more than students who received only one degree. One reason for the large number of excess hours associated with dual degrees is the requirement that the last 30 credits toward the baccalaureate degree be completed in residence at the college from which the student will graduate. When degrees are received from two colleges residency must be fulfilled in both.

Excess Hours as a Function of Dual Degree or Dual Major



Frequency Distribution Number of Excess Credits



This chart shows the distribution of excess credit hours by the number of students at 12 hour intervals. The largest number of students took 12 or fewer excess hours, or 10% or less over the number required. One hundred and one students took no excess hours. The number of excess hours varies by discipline with students in professional programs taking more excess hours than those in the humanities and social sciences. Students take excess hours to enhance their skills, expand their horizons, or maintain full-time status while seeking entry into required courses. These all represent elements of excess hours that offer an opportunity for reduction.



Measuring University Performance: Transfer Students

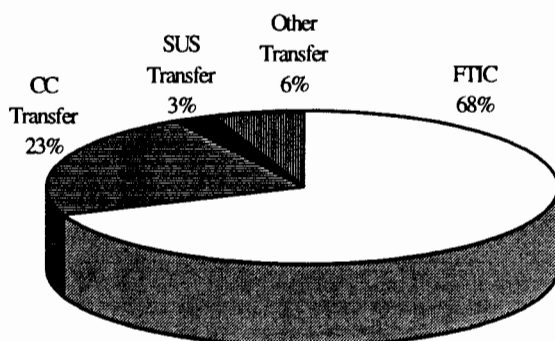
Issue II:1 January 1, 1996

Summary

One of the special characteristics of the University of Florida, compared to its reference group among AAU public research universities, is the large number of community college students in its undergraduate population. This is the result of the state's policy of encouraging students to pursue their first two years of undergraduate study at community colleges and their upper division work at one of the state's universities. This two + two system gives the university a larger upper division than lower division, the reverse of what occurs in most universities of our type, and a substantial number of students whose first two years of college work took place at a community college. About one-third of UF's community

college transfers come from Santa Fe Community College in our county, and the rest come from the other 27 community colleges located throughout the state of Florida. The charts and tables presented here show that the preparation of AA transfers is equivalent to that of students who begin their work at the University of Florida. Students admitted to the high demand upper division programs at UF come in the same proportion from the community colleges and from UF's lower division students and the performance of community college students who transfer to UF is quite similar to that of students who began their college career here. Thus the two + two system works well at the University of Florida.

FTIC and Transfer Undergraduate Students

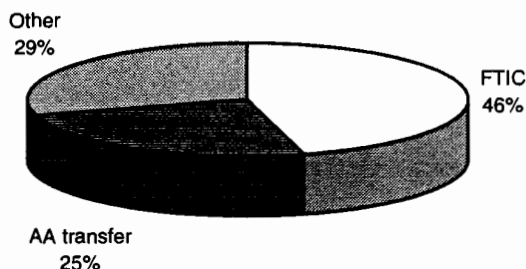


This chart shows the distribution of undergraduate students. CC transfers include transfer students from community college who came with and without AA degrees. SUS transfers come to UF from other state universities in Florida and the Other Transfers represent out-of-state students, foreign students, and transfers from private colleges and universities in Florida. FTIC is the state term for university students who enroll as freshmen and stands for First-Time-In College.

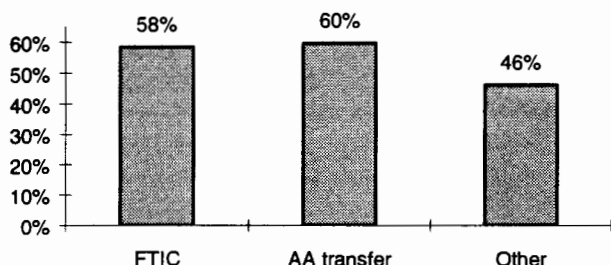
This strong commitment to community college education makes us very conscious of the quality of the preparation students receive at their community colleges. This preparation appears in various ways. The first involves acceptance into high demand programs at the university. Because the university does not have space for every student who wants to study in every field, some programs have admission criteria that students must meet if they are to be admitted. To ensure fairness, we require exactly the same standards of admission to these high demand upper division programs for students who come to us from community colleges and for students who began their collegiate careers at the University of Florida.

The first chart in this series indicates the distribution of students who apply for admission to upper division at the University of Florida. In this pool of applicants, UF students constitute almost half the applicants with community college students representing about a quarter of the applicants. Other students in this chart include transfers from community colleges who have not yet earned an AA degree and those who come from other public and private universities.

Composition of Pool of Applicants to Upper Division (1994-95)



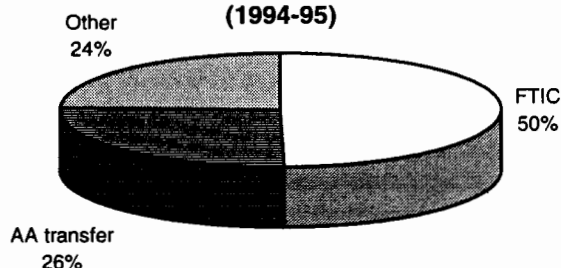
Percent of Applicants Meeting or Exceeding Admission Standards (1994-95)



This chart shows that within this pool of applicants, well over half of the AA transfers and the University of Florida students meet or exceed the admission standards for these high demand programs with special admission criteria. Clearly, then, the preparation of community college AA graduates is equivalent to the preparation of lower division University of Florida students for the purposes of admission to the university's upper division programs. While fewer community college students apply, the percent who meet the standards is the same as for UF students.

When the process of admission is completed, we can see that the pool of students actually admitted to the upper division reflects the distribution of those who applied, indicating that the quality of those who applied from community colleges and the University of Florida match rather closely and the composition of the admitted students matches the pool of those who applied. This demonstrates that the two + two system works effectively at the University of Florida, providing both community college AA transfers and University of Florida lower division students the same opportunity to participate in high demand University of Florida programs.

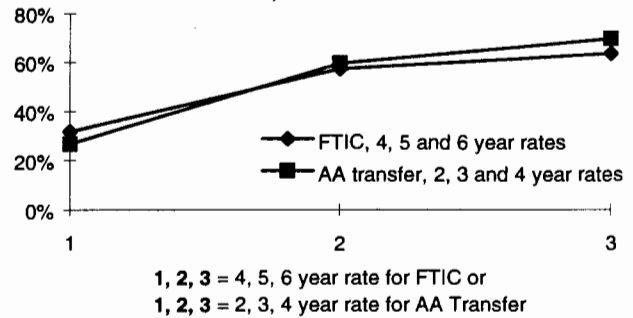
Composition of Pool of Students Admitted to Upper Division (1994-95)



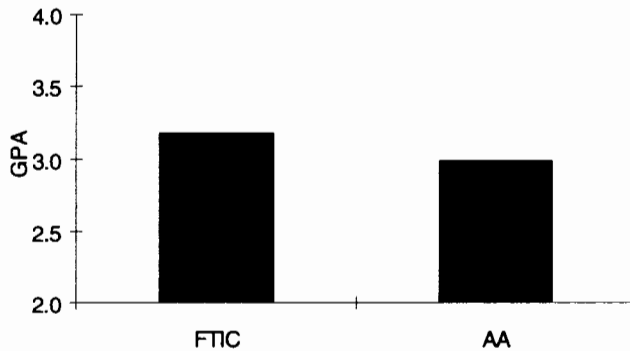
Given the quality of the students who attend the University of Florida, whether they come from community colleges or enroll at UF as freshmen, we would expect the performance of these students to be quite similar. And in fact that is the case. These two groups of students are roughly comparable since the UF freshmen have presumably had two years to complete their lower division work and the AA transfers have completed their lower division work before they come to us. So four years for a UF freshman to graduate is equivalent to the AA transfer's two years at a community college for an AA and the two years at UF.

As the following chart shows, the graduation rates of these students are remarkably similar. This chart takes the FTIC students, those who enrolled at UF as freshmen, and measures how many of them graduated after four, five, and six years. The chart then compares this with the percentage of students who came to the University of Florida as AA transfer students, having completed their first two years at a community college, and then graduated after two, three, or four years at UF.

**Average Graduation Rate,
FTIC 1989-94, AA Transfer 1991-94**



**Spring 1995 Graduation Grade Point Average:
FTIC vs. AA Transfers**



Finally, the graduating grade point average for community college AA transfer students is almost exactly the same as for graduating students who enrolled as freshmen at the University of Florida, further demonstrating the high quality of the preparation community college students receive.

Graduation rates can confuse us because they do not tell the complete story of students who come to the university. The standard graduation rate takes the total number of students enrolled as freshmen and then calculates the percentage of these students who have graduated after four, five, or six years. However, this implies that those who do not graduate failed or dropped out of the university. While students surely do have unsatisfactory conclusions to their college careers, it is helpful to look at more than just those who graduated from the university as shown in the table below.

Result of Students Enrolled at UF After Six Years (FTIC) or Four Years (AA)	FTIC's FcI 1988		AA's FcI 1990	
	Number of Students	%	Number of Students	%
Still at UF	69	2%	17	2%
Left before upper division	585	19%	4	0%
Left after upper division	123	4%	136	16%
Graduated from UF	2123	69%	671	77%
Graduated from another SUS institution	183	6%	49	6%
TOTAL	3083	100%	877	100%

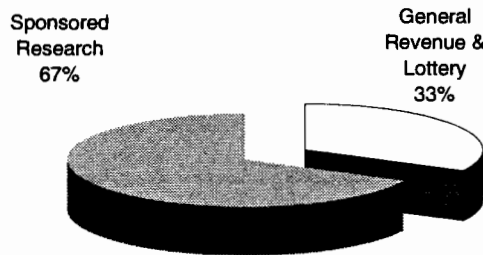


Measuring University Performance: Research Benefits

Issue II:2 February 1, 1996

Research is central to the University of Florida mission. We are a research university with a requirement to develop high quality competitive research for this state and to sustain a research base capable of addressing local, state, and national issues. The chart here shows that sponsored research expenditures are twice the general revenue and lottery money expended on research at UF. Sponsored research is money obtained competitively for research and the level of sponsored research is used as a measure of the quality of a university.

Research Expenditures, General Revenue and Lottery and Sponsored Research, 1994-95



Research is discovery; it is the exploration of the edges of knowledge to expand our understanding. Research sometimes produces an immediate benefit, such as when we invent a new variety of tomato that creates an industry in Florida. Research sometimes appears to produce no benefit at all, as the discovery of lasers appeared to almost everyone twenty-five years ago that now serves as an essential device in surgery and consumer electronics devices such as CD players. Research often produces the opportunity to expand our understanding and build the foundation so that future research can produce results. So the apparently abstract research in physics on measuring nuclear magnetic resonance led, eventually, to the production of MRI machines that help us understand and remedy a host of previously fatal or disabling medical conditions.

Each generation worries that the research it supports does not appear to produce immediate

benefits, but at the same time each generation of Americans enjoys enhanced lives from the research results of their parents and grandparents. This generation-skipping legacy of research works as effectively as compound interest, but

unlike the individual investment that generates compound interest we all must invest in American university research to ensure that our grandchildren will indeed live the best lives possible.

Even though university research requires an act of faith, it also demands great rigor

and accountability. While we do not know for sure which of our research initiatives will, in the end, cure cancer, prolong life, or decipher the mysteries of the universe, we can measure the productivity of our research enterprise. Research, while sometimes a lonely individual pursuit, requires validation by others. So that when we produce results, we must submit them to the review of the best experts in the world. Partly we do this to disseminate the results of our research, to display the product. Partly, however, we do this to submit our work to the critical review that can find errors, suggest improvements, or replicate our results. By this constant critique and review we ensure that what is good in science, social science, and the humanities endures.

Some of our products reach large audiences through books of history or literature or through the production of widely viewed art. Others of our products reach only very small audiences expert in the arcane disciplines of mathematics,

philosophy, or science. The value of our work, however, does not depend on the size of the audience so much as it does on the advance it gives to our knowledge. So the mathematical formula impossible for me to understand and accessible to only a few thousand experts in the world, may well help us predict the weather and plot the path of comets and planets, or design optimally efficient shapes for automobiles.

No university covers every possible area of research expertise, and at the University of Florida we focus our efforts and define our missions to provide a research substance that underlies our teaching focus. The resources for this mission come from the state dollars and from earned dollars, and this edition of *Measuring University Performance* describes how we focus our resources to produce the maximum benefit from our research investments.

Types of State Supported Research

The State of Florida supports two major types of research. The first takes place through IFAS, the Institute for Food and Agricultural Science, as part of our mission as a Land Grant institution. IFAS pursues research with the direct purpose of enhancing the effectiveness and commercial viability of agriculture in Florida. This research involves work in laboratory and field, on issues of production, marketing, and environmental protection. The legislature funds IFAS' research mission directly and explicitly because it addresses directly the economic health of the state of Florida. This investment has, over the years, produced a substantial return to the citizens of the state by permitting the development of a wide range of Florida agricultural industries that would have been impossible without the research base of IFAS.

For this reason, we evaluate the research productivity of IFAS against the funds provided from the state in terms of the enhancement of Florida agriculture achieved. By any measure IFAS is one of the state's best bargains.

The second category of research takes place in all the other colleges of the university including

the Health Sciences Center. This research varies from explorations at the outer edges of knowledge with not a glimmer of immediate practical benefit, as in the development of quantum theory that was necessary in order to develop lasers, to the most practical research on the strength of materials used in building roads, bridges, and schools. While the products of this research vary

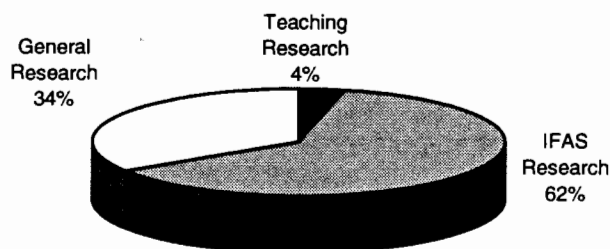
dramatically from the art exhibit to the specifications for concrete, we can find a variety of indexes to the productivity of the research work we do.

In this second category of research, we first

recognize that the teaching mission of the university requires that our faculty engage in research scholarship to maintain the currency of the expertise that underlies their instruction. This effort represents 10% of the total faculty effort and 4% of general revenue and lottery expenditures on research at the University of Florida. Scholarship of this variety does not necessarily produce publications, and faculty who engage in the research that supports teaching do not have an obligation to publish because the product of this research appears in the enhanced quality of their teaching.

For the rest of the research effort in this second category, however, we require publication. Publication takes many forms. It can involve an article in a journal, an exhibit in a gallery, a book for popular audiences, or the appearance of a poem in a magazine. Whatever the form, publication represents the product of the research effort, and without a product there can be no contribution to our store of knowledge. A promising idea that never sees the light of day cannot be criticized and tested and cannot contribute to the national and international conversation that moves our understanding forward. Science, for example, that remains an unexpressed idea contributes nothing to the combination of ideas, experiments, and theories out of which come the cumulative improvements in our lives. So we demand that research, to be considered research, must in a reasonable period

General Revenue + Lottery Expenditures on Research, 1994-95



of time produce a publication or a public expression of results that can be reviewed and understood by others.

Because research requires an investment of resources, we expect every faculty member engaged in research to seek outside sources of funds to support their research. In some fields, few sources exist for research support where in others, we find research dollars more easily available. In almost every field, our faculty compete against the best in the world to get these outside dollars, and so the amount of dollars earned serves as a rough approximation of the aggregate quality of the university's research enterprise. This is the measure used almost universally on a national scale to evaluate the research productivity of institutions.

The state of Florida invests a substantial amount of state dollars into general research, and the best indicator of the university's effectiveness in using these dollars comes from the ratio of state dollars invested directly in general research to the outside dollars earned by university research. At the University of Florida we expect that in the aggregate, this ratio will reach at least 3 to 1 for non IFAS research, that is 3 outside dollars earned for every 1 state dollar invested in general research. This rough measure serves as a quick and effective reference for research productivity but it does not serve as an effective management tool inside the university.

Inside the university we use more refined if less easily aggregated measures. Here we attempt to measure research by discipline, college, and field in order to benchmark our productivity to the competition. We look at NSF, NIH and DOE grants as indicators of our competitiveness. We watch the rate of applications for new grants as an indicator of our aggressiveness in the pursuit of new dollars to support research. We review our success in developing patents and licenses to ensure that we capture the maximum return on the commercial success of our inventions in support of future research. We review the university's success in acquiring private and foundation funds for research and corporate contracts for research. Each of these sources represents a competitive opportunity and we will not succeed unless we are better than the competition.

Eventually, though, people will always ask, "But what do we get for this research?" Here then is a sampler of research products that made a difference in Florida, recognizing that some of the best research in progress today will produce results like these only for our children and their children.

RESEARCH MAKES A DIFFERENCE

1960s UF research on chemical reactions of clay minerals and lime

- = the first lime stabilized highway in Florida (I-75 across Paynes Prairie)
- = 30 years of success with highways over difficult terrain in Florida

1940s Nuclear Magnetic Resonance discovered, uses not clear

- = 1960s research on possible images from this technique, UF part of research (UF)
- = 1990s standard use of MRI to diagnose microscopic tumors (UF)
- = 1990s early detection and cure of tumors (UF)
- = 1990s UF Mag Lab uses MRI to do research on large molecules, uses not clear

1995 UF study of ocean up and down currents, uses not clear

- = prediction that rip tides eventually bring swimmer back to shore
- = demonstration that it is safer to tread water and let rip tide return swimmer to shore
- = changed safety instructions that saves lives

1980s UF computer program designs bridges facing hurricanes, tidal waves, ship impact

- = reduced time for design from days to hours
- = ability to find alternate and best designs
- = savings of \$2.3 mil SR 10 bridge over Apalachicola
- = system chosen for all Federal bridge projects

1942 UF IFAS developed heat tolerant tomato

- = Florida growers' opportunity to produce a tomato crop in the fall
- = further research that improves yield, flavor, durability, resistance to disease, nutrition
- = rise of Florida as the nation's leading supplier of fresh winter tomatoes

1985 UF research on archaeology near St. Augustine

- = discovery of the location of Ft. Mose, first free black community in new world
 - = production of a traveling exhibit on Ft. Mose for Florida school children
 - = recovery of a critical part of Florida's heritage
-



Measuring University Performance: Student Quality

Issue II:3 March 1, 1996

Summary

Students represent one of the primary reflections of university quality. This quality comes both from the initial scores of the entering class and from the performance of students after they leave the university. In determining institutional quality, we review these indicators of quality recognizing that they benchmark the university against national standards and help us understand how well we do relative to our peers. At the same time, we also recognize that these measures do not easily link to budgets or specific annual evaluations, being the result of long term activities and characteristics of the institution.

In addition, student satisfaction with the program of the university offers a somewhat different perspective on quality, and the better the students and the better their performance, the more important their evaluations of our programs. While student satisfaction remains an important indicator, it too reflects the cumulative reflection of many years of experience both in class and after graduation.

University of Florida undergraduates rank among the top ten AAU public institutions in various measures of quality. This year, *U.S. News & World Report* rated the University of Florida the second best buy in higher education in the United States, reflecting the very high quality education delivered at a very low price. Our alumni are overwhelmingly satisfied with the education they receive, and after graduation they become successful and productive citizens. This issue of *Measuring University Performance* provides a variety of indicators that reflect the quality of our students, the quality of their experience at the University of Florida, and the success they demonstrate after graduation.

Initial Quality of Undergraduates

As the University of Florida increased enrollment over the last ten years, it also increased selectivity in admissions. In 1985, the middle 50% of SAT scores fell between 1000 and 1170; ten years later, by 1995, the middle 50% fell between 1080 and 1250. This increase in scores reflects not only the increased quality of the institution and its attractiveness to Florida high school graduates but also the substantial growth of college-age population in the state.

1995 National Merit Scholars		
Public & Private Universities		
Rank	No.	University
1	368	Harvard/Radcliffe
2	221	Texas
3	214	Rice
4	194	Texas A&M
5	178	Oklahoma
6	169	Yale
7	158	Stanford
8	129	FLORIDA
9	129	MIT
10	125	Brigham Young
11	124	Princeton
12	113	Georgia Tech
13	100	Northwestern
14	100	U. Southern Calif.
15	91	Ohio State

In 1995, the University of Florida ranked eighth among all universities and fourth among public universities in the number of National Merit Scholars as the table above shows. The university also ranked among the top ten AAU public universities in both SAT scores and in the high school standing of its freshman class.

**AAU Public Universities
Midpoint SAT Scores**

1	Berkeley	1240
2	Virginia	1225
3	Michigan	1180
4	UCLA	1135
5	UNC, Chapel Hill	1130
6	Texas	1120
7	UC, San Diego	1110
8	FLORIDA	1100
9	SUNY, Buffalo	1093
10	Wisconsin	1085
10	Maryland	1085

**Freshmen in Top 10% of
High School Class**

1	Berkeley	95%
1	UC, San Diego	95%
2	UCLA	93%
3	UC, Santa Barbara	91%
4	Virginia	77%
5	UNC, Chapel Hill	72%
6	Michigan	65%
7	FLORIDA	60%
8	Illinois	50%
9	Texas	44%

Alumni Satisfaction

Surveys of alumni offer another perspective on the quality of undergraduate student experience. The Florida Survey Research Center contacted alumni in 1993 and found that 94% remembered their overall experience at the University of Florida as positive, and half of the alumni rated their undergraduate experience as excellent. The Survey Research Center used a randomly selected group from a list of all 1990-92 graduates.

Given these almost universal positive overall impressions of the University of Florida undergraduate experience, it comes as no surprise to find that most alumni surveyed (85%) would definitely recommend the University of Florida to a friend or relative considering college.

Another survey, of the graduating class of May 1993, found graduating seniors also give

**Would you say your overall experience
at the University of Florida was
Excellent, Good, Fair, or Poor?
1990-92 Graduates**

	UF	BA	MA/PhD
Excellent	50%	55%	37%
Good	44%	41%	54%
Fair	5%	4%	7%
Poor	1%	-	1%
Don't Know	-	-	1%

highly positive ratings to the university, although they express somewhat less enthusiasm at the moment of graduation than they will probably feel after a few years as alumni. About nine in ten seniors rate their academic experience as excellent (28%) or good (60%). Nearly three-fourths (72%) of graduating seniors say they would definitely recommend the University of Florida to a friend or relative considering college. An additional 21% would probably recommend UF while only 4% said they would not recommend the university.

Alumni Success

One of the reasons alumni rate the university so highly is their success in gaining employment after graduation. Of the undergraduate degree recipients surveyed, 91% reported that they had employment or were pursuing further education. Only 6% remained unemployed after graduation. Most of the graduates had relatively high status jobs with only 5% in blue collar occupations while the remaining 95% worked in professional/ executive or white collar occupations.

Those who went on for further education pursued a variety of advanced degrees. Just under half (47%) worked on Master's degrees, another 12% pursued doctoral degrees, and the remaining 41% sought professional or other degrees.

**Employment Status of
UF Undergraduate
Alumni**

Employed	61%
Unemployed	6%
Student	30%
Homemaker	1%
Other	2%

This survey also looked at combined Master's and Ph.D. graduates. Among these advanced

Type of Employment for Employed Baccalaureate Degree Recipients

Professional/Executive	28%
White Collar - Technical/Clerical	67%
Blue Collar	5%

degree recipients, only 7% remained unemployed at the time of the survey.

Professional Degrees

Students who graduate in a professional program often measure the quality of their professional education by tracking their pass rates on professional licensure examinations. The high opinion University of Florida graduates have of their professional programs

Pass Rates on Licensure Examinations in Professional Fields

	Number Taking Exam	Number Passing Exam	% Passing Exam
Dentistry	70	65	93%
Law	367	339	92%
Nursing	146	137	94%
Pharmacy	99	96	97%

derives in considerable measure from the high pass rates they achieve on these exams as reflected in the table.

Ph.D. Recipients

A separate survey of Ph.D. recipients in science and engineering showed that only 1% were seeking employment. Among the employed, 83% of these graduates reported

that their Ph.D. degree proved important in obtaining their current position. All but 1.4% found their Ph.D. training important in preparing them for the work they performed in their present position. As the table indicates,

Salary of UF Ph.D. Degree Recipients

	<\$30,000	>\$30,000	>\$45,000
Physical Sciences	10%	57%	30%
Life Sciences	9%	35%	53%
Engineering	0%	20%	63%
Social Sciences	13%	62%	17%
Other	11%	61%	22%
All Fields	7%	42%	44%

Ph.D.'s in various fields ended up in jobs with good salaries.

Conclusion

None of these data provide an exact representation of quality, and each indicator offers but an indirect measurement of the quality delivered to students and contributed by students to the educational mission of the university. The key to understanding these data is not to take them as absolute measures but rather as relative measures of an underlying quality that may be hard to identify but whose indicators we can find consistently in many places.

Employment of UF Recipients of Ph.D. Degrees

	Percent Employed	% Voluntarily Unemployed	% Seeking Employment
Physical Sciences	97%	3%	0%
Life Sciences	97%	3%	0%
Engineering	97%	2%	2%
Social Sciences	92%	8%	0%
Other	94%	0%	6%
All Fields	96%	3%	1%



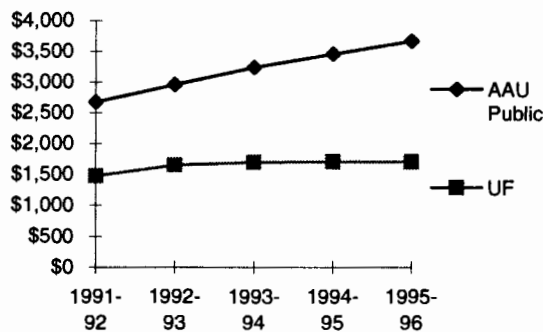
Measuring University Performance: Financial Aid

Issue II:4 April 1, 1996

Introduction

As public universities throughout the country struggle to maintain quality--as state revenue to higher education grows less rapidly than costs and in some instances declines--everyone's attention turns to tuition and fees. Students in public universities pay widely varying prices for their undergraduate degrees. Tuition and fee packages among AAU public universities, for example, vary widely around a middle point of about \$3,500 per year for in-state students. Many states increased tuition rapidly in recent years, while others, like Florida, kept tuition stagnant even as state support for public higher education declined. In the debate over who should pay for college, we focus much attention on the financial aid that helps students and their parents pay those costs.

Annual Growth in Tuition and Fees
1991-92 to 1995-96



Financial aid means different things to different people. To some, it implies a grant or scholarship that helps a student pay for tuition and books. To others it means loans or subsidized employment. Financial aid is all of these things. It comes from many sources, and universities distribute it to students in accord with a bewildering array of rules and regulations that apply to the financial aid dollars from each of the sources. In spite of the complexity of the details,

however, we can draw a profile of the financial aid provided to students at the University of Florida.

Tuition and Fees

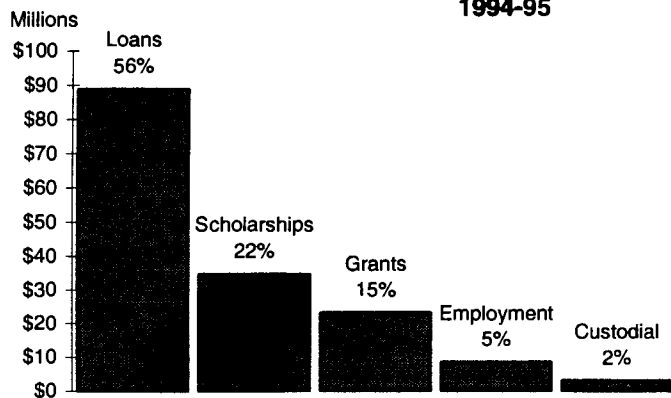
The University of Florida, with all of the public universities in the state, has held tuition constant for the last five years even in the face of continuously rising tuition among our competitor institutions among the Association of American Universities public institutions. As the chart illustrates, tuition in Florida universities stagnated at about \$1,700 per year in 1992-93 while our competitors' average tuition grew from over \$2,500 to well over \$3,500 in the same period. Florida residents who attend the University of Florida now pay only half of what the residents of other states spend to attend the public AAU university in their home state. Between 1991-92 and 1994-95 the University of Florida saw its tuition and required fees rise only 16% while its competitors' prices rose by 37%.

Some may regard this as a triumph of efficiency by Florida's public universities, but it actually reflects a disinvestment in higher education as support per student from the state falls at the same time tuition fails to meet the market for price. Absent effective action such as the tuition proposals currently under discussion in the Florida legislature, the university will see a decline in the quality of library, technology, facilities, equipment, faculty, and staff.

Types of Financial Aid

Even with the lower rates of tuition, students at the University of Florida take full advantage of all financial aid programs. Over half the financial aid distributed to our students comes in the form of loans. Scholarships and grants account for just under 40% of the aid, with subsidized employment and various custodial programs providing the remaining 7%. This profile indicates clearly that financial aid for students is

Financial Aid by Type 1994-95

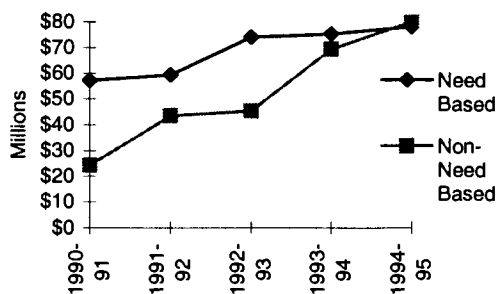


less a process for distributing gifts or scholarships than it is a methodology for processing loans of various kinds.

Not all financial aid represents support for students with a substantial financial need. At the beginning of this decade, in the 1990-91 academic year, we distributed just under \$60 million dollars of need based aid to students who could demonstrate that they did not have the financial resources or their families did not have the financial capability to send them to college. We distributed about half as much (under \$25 million) in non-need based aid to students as need based in 1991-92. By the 1994-95 academic year the need based aid grew to under \$80 million dollars, but the non-need based aid accelerated by 300% to the same level. This growth in non-need based financial aid, dollars delivered to students through university based student aid programs that require no test of financial need, reflects the expansion of loan programs throughout this five year period and a change in the Federal definition of need.

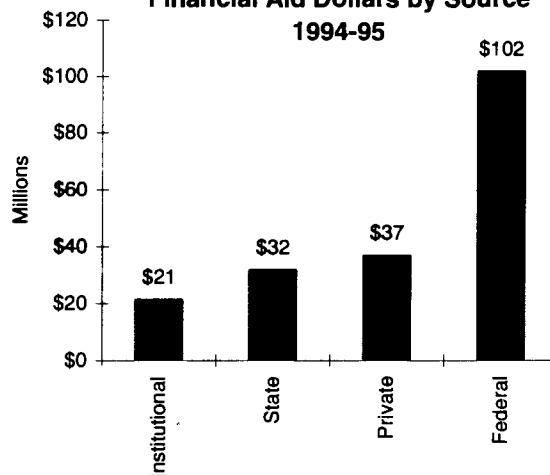
Looked at more closely, the financial aid

Need Based and Non-need Based Financial Aid



(need and non-need) distributed by the University of Florida in the past academic year came from four primary sources. By far the largest amount, some 102 million dollars came from Federal sources, primarily various need and non-need based loan programs. State and private sources of funds, mostly grant programs and scholarship

Financial Aid Dollars by Source 1994-95

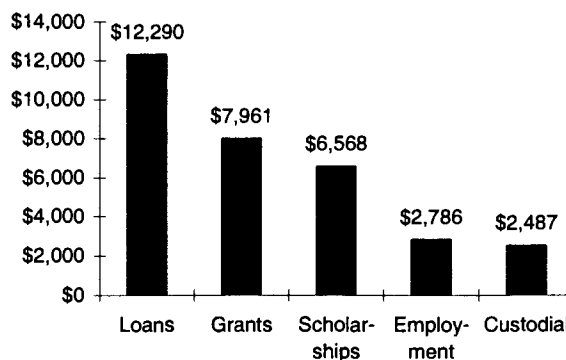


programs, provided \$32 and \$37 million dollars respectively, and the university from its own resources distributed some \$21 million, in both need and non-need based aid. Clearly, then, the Federal loan programs remain the major engines of financial aid for this and every other comparable university.

Student Debt

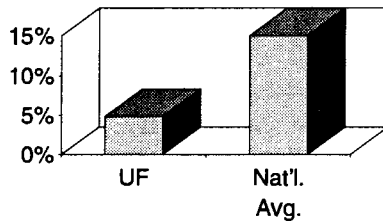
Even with stable tuition over these years, the loan indebtedness of students has risen dramatically. Recognizing that the cost of an education to students has remained virtually constant over most of this period, the dramatic increase in student loan indebtedness reflects more the availability of non-need based loans than

Financial Aid by Type, Spring 1995 Graduating Seniors



it does any increase in the cost of higher education. The average loan indebtedness of UF undergraduates rose from \$6,000 in 1990-91 to

**Federal Loan Default Rates,
1993-94**



above \$12,000 in 1994-95. University of Florida students, with a very low cost of education, can repay their loans and have a default rate under 5% while the national average is about 15%. An indication of the consumer nature of University of Florida student debt is that while college costs at the University of Florida have risen by about 15% between 1991-92 and 1994-95 the debt our students have incurred while in college has risen by 300%. Clearly, students buy something other than the cost of education.

A more precise understanding of student indebtedness comes from an analysis of the baccalaureate degree recipients of Spring 1995. Of these 2,700 graduates, about 80% received financial aid at some point in their career. About 97% of African American students, 82% of Hispanic students, and 80% of White students received financial aid. Graduating seniors overall had about \$15,000 in need based aid and \$8,179 of non-need based aid. Some students had both kinds of financial aid. If we look at students with both need and non-need based aid, some 960 graduates, they received on average about \$15,300 of need based aid, and \$7,600 of non-need based aid. Those with only need based aid (280 students) had about \$15,800 of aid and those who had no need (936 students) had about \$8,794 of aid.

Students appear to be willing to accumulate some non-need based assistance to improve the quality of their lives beyond the basic necessities required for attending college. In determining need, we follow standard national guidelines. We take the cost of instruction plus the cost of living in Gainesville as the cost of an academic year. Then we subtract from this cost whatever the analysis of the student's and parents' resources

and obligations indicates the family can afford towards this education. The remainder is the need the student has that we can meet with need-based financial aid. Amounts received above this are non-need based aid.

The parents of a University of Florida student who receives financial aid have an average income of about \$41,000 dollars. The average student, dependent on a parent, has an income of some \$2,250 dollars. So the total family income of students included in our survey of incomes (about 17,000 students) is something on the order of \$43,000 dollars. Students no longer dependent on their parents have an average income of about \$10,000. Average incomes for student families range from a low of about \$29,500 for black families to a high of about \$45,500 for white families.

1994-95 Average Income by Race*			
	Dependent Parent	Student	Independent Student
Black	\$29,510	\$1,406	\$8,404
Asian	\$35,555	\$1,402	\$6,912
Hispanic	\$33,872	\$1,691	\$8,294
White	\$45,491	\$2,610	\$10,485
Average	\$41,224	\$2,247	\$10,011

* Students reporting race and income information

Dependent students = 10,653. Independent students = 6,937.

Conclusion

Students with financial aid may feel slightly more pressure to graduate quickly. Some 56% of students with financial aid as compared to 45% of students without financial aid graduated within 4 years or less of entering as freshmen. A similar pattern exists for transfer students with 33% of the financial aid recipients and 29% of the non-financial aid recipients graduating within 2 years of transferring to the university.

Average consumer debt in the United States including mortgages and credit cards runs about \$18,500 per person including everyone from babies to great grandparents. Students at the University of Florida who graduate with some \$12,000 of debt are well within the range of consumer debt. In perspective, the first new car our graduate will buy will equal at a minimum the total indebtedness from a college degree. The car will decline in value every day after it leaves the showroom. The college degree, however, will grow in value as the student's life time earnings increase.

Conclusion

The materials presented in this Handbook represent a work in progress. The pursuit of quality and efficiency, and the endless conversation about accountability with our many constituencies, guarantee that this work will remain an ever changing challenge. Over time, some of the issues that appear central to the higher education debates of today will decline in significance, only to be replaced by other controversies of equal contemporary import. The key to success in any quality process, of course, is not so much the achievement of extraordinary moments of excellence, however heartwarming and publicity provoking those may be, but rather the constant improvement in the many details within the institutional mission that improve all of the quality, all of the efficiency of our work and, at the same time, reduce the variations in quality and productivity that may occur in this or that college or department. This work depends on

quality data, carefully collected and constantly validated. It depends on a commitment to take action to move the university to achieve its missions. It requires a recognition that tomorrow's world for universities will not offer the graceful expansionism of the post-World War II generation. The success of quality and productivity campaigns, such as the one for which this handbook serves as an interim guide, depends on the belief that quality is the principal determinant of university reputation and success and that increased productivity is the best method to acquire the resources that quality demands.

We look forward to continued conversations on these subjects and improvements on these initial tools. We welcome alternative ways of approaching this common university imperative, and we gratefully thank all those who have helped us along the way.