

Cost Accounting for the Academic Missions at the University of California

by Charles Schwartz, Professor Emeritus, University of California, Berkeley

Schwartz@physics.berkeley.edu July 16, 2014

posted at <http://socrates.berkeley.edu/~schwartz/CostAcctUniv.pdf>

Abstract

When research universities calculate the average per-student cost of providing undergraduate education, they use an old method that bundles together the costs of undergraduate education, graduate education and unsponsored research. This gives a very bloated answer, which, among other harms, distorts rational debate about student tuition and fees. A new state law in California requires that the state's premier university system disaggregate that bundle of costs. This paper describes the author's previous calculations of this problem, relying on a variety of data sources published by the university itself. The results reported here stand in stark contrast with official statements about the institutional cost for providing undergraduate education; and this calls for a severe reformation in cost accounting at all research universities.

Introduction

When the California Legislature passed the state budget for 2013-14 there was a trailer bill (AB 94) that placed some new reporting requirements on the University of California (UC). Article 7.5 says that UC shall report, starting in October 2014, on "the costs of undergraduate education, graduate academic education, graduate professional education, and research activities." (LeginfoCA 2013)

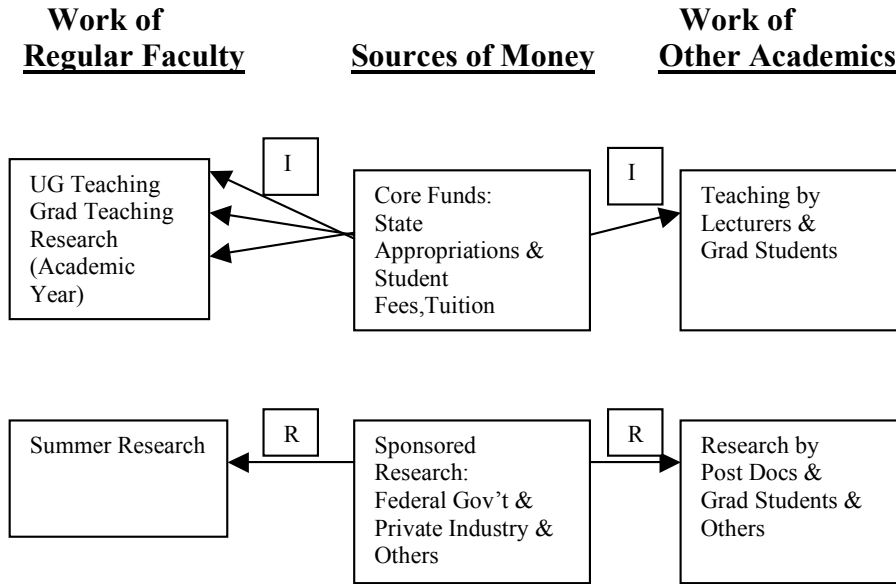
How will the University respond? The Budget Office at UC's Office of the President (UCOP) has already said (UC_Regents 2013) that this report will concern the spending of "core education funding", which is state appropriations plus student tuition and fees; thus it is not concerned with sponsored research or endowment funds or auxiliary enterprises or medical services. But this will require a big change from past habits of cost accounting.

It has been the practice of this University, along with all other research universities, to bundle all those academic mission costs together and issue a statement of the total, which they may call "The Cost of Education." For the fiscal year 2011-12 UCOP said that this cost amounts to \$17,390 per student; and they describe this as being covered to the extent of 49% by student fees and tuition. (UC_Budget 2011) This is very misleading.

To enter this study, let's start with a picture, in Figure 1, showing the basic activities and payments that should be completely familiar to any professor at a research university.

Figure 1

Basic Financial Picture of the Research University



In this picture the label [I] indicates expenditures counted as a cost of Instruction and the label [R] indicates expenditures counted as a cost of Research.

This set of accounting rules has been around for a long time and it is followed by all US universities. The organization NACUBO (National Association of College and University Business Officers) maintains these rules for accounting. In a 2002 report (NACUBO 2002) NACUBO proclaimed that all of the costs counted under “Instruction”, including that portion of faculty research activity, should be included in counting each institution’s cost of providing undergraduate education. The formal accounting documents use the phrase “Departmental Research” to cover any research activity at the institution which is not paid for by an external source or a specific budget item; and the cost of Departmental Research is to be included in any calculation of expenditures for Instruction. I have been able to trace this trick of accounting back to a book published in 1930 by the Comptroller of the University of Illinois. (Morey 1930)

A recent report from the National Research Council (NRC 2012) does raise the idea that the old NACUBO rule on how to account for Departmental Research needs to be revised; but they are somewhat vague on how that should be done.

UC, along with all other universities, has followed that old procedure: the entire cost of professors’ academic year salaries is recorded as an expenditure for Instruction. When in the past I have lodged formal complaints with the UC administration about what I consider false and misleading accounting practices, they have responded that the higher education community follows that methodology promulgated by NACUBO.

The new state law in California requires that UC disaggregate that bundle of costs and show the separate expenditures for each major component. How should this be done?

This paper describes the methodology I have developed over several years in an independent attempt to calculate the University's cost for providing undergraduate education, as distinct from the costs of graduate education and unsponsored research. There are two parts of this methodology, both using data sources established by the University. The first part uses a Faculty Time-Use Survey, which leads to the conclusion that, on average, 21% of the work time of regular rank faculty may be fairly allocated to undergraduate education; and the second part uses the detailed accounting reports, UC Campus Financial Schedules, which lets one get the relevant portions of expenditures for Instruction, Academic Support, Student Services, and overhead costs. These two parts of the methodology are described in the following sections.

Methodology Part 1: Faculty Time-Use Data

In the jargon of economics and business management we are faced with the “joint production problem” – How do we assign costs for individual products when the same employees work on more than one of them? The standard answer is “activity-based costing” – Measure what fraction of their work time, on average, is spent on each product. [The following comes mostly from my unpublished paper (Schwartz 2007).]

We have the “University of California Faculty Time-Use Study, Report for 1983-84 Academic Year.” (UC_FTU 1984) This survey covered all ranks of Professors, but not Lecturers or Graduate Student Instructors, at all of the UC campuses, excluding those in the health sciences and law.

On page 3 of this report are Highlights of the Study Findings:

Regular faculty members (100% I&R FTEs) spent an average of 61.3 hours a week on University-related activities of all kinds. This total includes:
26.0 hours on instructional activities;
23.2 hours on research/creative activities;
6.6 hours on university service;
5.5 hours on professional activities/public service.

The instructional activities cover course preparation, office hours, meetings with TAs and with colleagues, and other detailed activities in addition to class time. I also recommend that people look at the two graphs on pdf pages 83 and 84 of that report, which show the distribution of answers from the many individual faculty members who responded to the survey. The total number of hours spent working for UC is a fairly compact distribution (with an average of 61.3 hours per week); the distribution for time spent at Instructional activities is much more diffuse, with some people showing very low and others showing very high numbers of hours. But all we need is the average: 26.0 hours per week.

Further data, found in Tables 3 and 4 (on pages 38 and 39 of the report), show that faculty instructional time (counting both “regularly scheduled course instruction” and

“independent/special study supervision”) was evenly divided between undergraduate and graduate courses. Thus we get the first estimate of the fraction of professors’ work time that goes to undergraduate instruction: $(1/2) (26.0/61.3) = 21\%$

Next, we improve that result by noting further relevant data provided in the Time-Use study. At the conclusion of the Highlights section, on page 4, we find the following statement: “Of the time spent on non-instructional activities during the 1983-84 academic year, an average of 7.3 hours a week also contributed to instructional activities.” The details of this additional data are given in Table 5, on page 41, and I have concluded that this increases the 21% figure above to about 23%. (See my December 2007 paper for details of this analysis – which is open to some debate.)

Finally, there is also the correction for sabbatical leaves, which gives a 10% reduction to 21% as our final answer.

What is most significant about this data source is that the inputs come from the very people who are best informed about how faculty spend their time – the faculty members themselves. Furthermore, the data noted two paragraphs above properly rebuts the common criticism that a simple time-use study cannot account for the (presumed) positive contribution that faculty research activity makes to undergraduate education.

Alternatives:

Some have questioned whether this Faculty Time-Use Survey is too old to be credible today. One can certainly repeat the survey; but that may take some time to do right. My own studies suggest that little has changed in the last 30 years; and the most likely change would be a small decrease in the proportion of professors’ work time spent at undergraduate teaching. (See some details in the Appendix of this paper.)

Some reject the measuring of time spent as a reasonable measure of cost allocation. I think it is rather easy to argue that time is the most valuable asset for professors whose career is based upon their research. But I would also invite anyone to offer a better measure.

Here is one idea for an alternative methodology. Survey faculty members on each UC campus who have served on the Committee on Academic Personnel (called the Budget Committee at Berkeley) and ask them to assign weights given in the standard process of evaluating individuals for appointment or promotion or merit increases: What percentage for research, what percentage for undergraduate teaching, what percentage for graduate teaching, what percentage for service of various types?

Methodology Part 2: Digging Through the Accounting Reports

The primary resource is the annual posting, UC Campus Financial Schedules. (UC_FR) [The following comes mostly from my unpublished paper (Schwartz 2013).]

Look at Schedules B (for each campus), Current Funds Expenditures by Uniform Classification Category. Start with the category **Instruction** and remove several items that are outside of undergraduate education: University Extension and Summer School (\$298 Million), all the Health Sciences (\$1,853 Million), the other major professional schools of Law and Business Management (\$301 Million), and any remaining expenditures identified as coming from Restricted Funds (e.g., Endowments) (\$144 Million). This leaves us with an Adjusted Direct Cost for Instruction amounting to \$1,975 Million for the fiscal year 2011-12. [Note, I also take out an amount shown in Schedule 11-B as Pension and Retiree Health Benefit Accrual, which is not an actual expenditure but a required bookkeeping entry representing future obligations.]

To get the Undergraduate Instruction part of this we first separate out the amounts spent on Lecturers (1857 FTE @\$75,000, 81% for undergraduates) and Graduate Student Instructors (\$156 Million, 87% for undergraduates). The remainder is then multiplied by the factor 0.21 and we arrive at,

- Direct Cost of Undergraduate Instruction = \$602 Million.

Academic Support. Expenditures for Academic Support: Libraries (\$260 Million - \$32 Million Restricted); Other Academic Support (\$1,552 Million - \$1,018 Million for Health Sciences, \$56 Million for Law and Business and \$40 Million Restricted = Adjusted \$438 Million). Allotting $\frac{1}{2}$ of the former and $\frac{1}{4}$ of the latter to undergraduates,

- Academic Support for Undergraduate Instruction = \$223 Million.

Student Services. From the total expenditure for Student Services (\$710 million), I subtract the \$231 Million spent for Student Health Services (paid for by other fees) and another \$45 Million of Restricted funds, giving us,

- Adjusted expenditure for Student Services = \$434 Million.

Overhead. Total expenditures for Institutional Support plus Operation and Maintenance of Plant amount to \$775 Million + \$540 Million = \$1,315 Million. If I spread this cost evenly over all UC expenditures, I get an effective overhead rate of $1315/22142 = 6\%$. In a previous calculation, I reduced the denominator of this fraction by the amount spent by the Medical Centers, assuming that they paid for their own "overhead" services: that gives an effective overhead rate of $1315/(22142 - 6366) = 8\%$. I am not sure which method is correct, so I'll use the figure 7%.

To this I might add the capital cost, estimated from the reported amount of Depreciation and Amortization, \$1,477 Million, less the amount already counted by keeping in Expense Capitalized, \$748 Million. If I allocate this cost uniformly over all expense categories, it amounts to another 3% to 5% overhead.

- Combining these, I get an estimated overhead cost rate of 11%.

Adding the contributions from Instruction, Academic Support and Student Services (79% for undergraduates), then adding 11% of that sum for overhead, we arrive at, **Total UC Expenditure for Undergraduate Education in 2011-12 = \$ 1,296 Million.** We can compare this to the earlier cited UC published claim that the Cost of Education is \$17, 390 per student; that equals a total expenditure of about \$4 Billion, or three times the amount calculated above for undergraduate education alone.

Note. In these calculations, neither UC nor I include any expenditure of student financial aid as a part of the cost of education; we also agree on excluding expenditures in the Health Sciences.

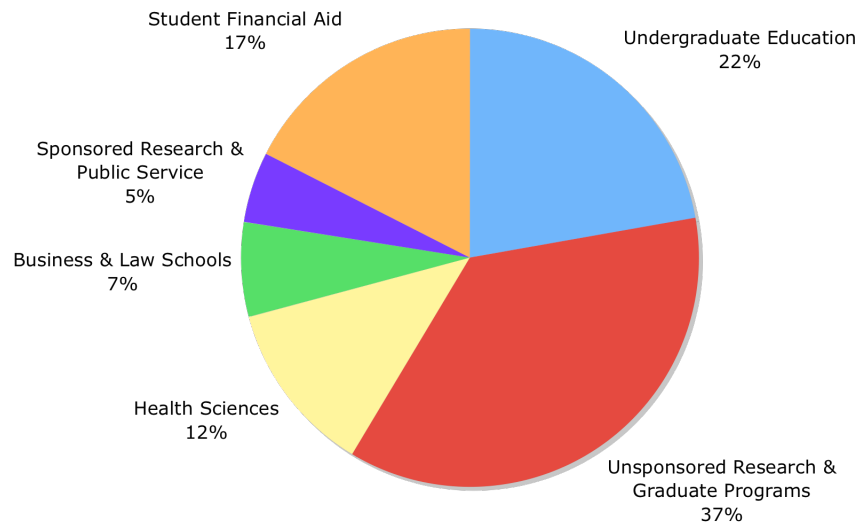
Results

In a recent paper (Schwartz 2013) I presented the graph, shown in Figure 2, based upon the type of calculations described above but showing more than just the undergraduate education portion of costs.

Figure 2

UC's Expenditures of Core Funds (\$6.1 Billion) 2011-12

State General Funds + UC General Funds + Student Tuition & Fees



If one adds the portions shown here for undergraduate education + un-sponsored research and graduate programs + business and law schools, then one arrives at a subtotal of 66%, which is just 3 times the undergraduate education portion of 22%. It is that larger amount that UC has previously cited as the “Average per-student Cost of Education”. When I

have formally complained to UC officials that their published claim is false and misleading, they respond that they follow the NACUBO rules, which are accepted by the entire higher education community.

I have presented my own version of how UC should respond to AB94. This methodology is really straightforward and conventional: it is called Activity Based Costing. I also acknowledge that there is room for refinement with better data and analysis; and I have repeatedly sought meetings with University budget officers to explore those issues.

I also believe that other research universities can readily adopt this new accounting methodology. The data from UC's Faculty Time-Use survey are critical; and I would argue that those results should be fairly accurate if applied to other institutions of comparable quality. "Comparable quality" implies a set of research universities that actively compete with one another in the hiring of the best research faculty members. What teaching loads and what other time-consuming responsibilities are expected of professors at each institution are key factors in that marketplace. Since UC has six of its campuses as members of the prestigious Association of American Universities, I would suggest that all members of that self-selecting organization could share UC's Time-Use data.

Some Opposing Arguments

When I have presented this analysis to faculty colleagues there are often a series of lively objections; and I should summarize a few of those exchanges here.

A. Faculty research activity makes valuable contributions to the quality of undergraduate teaching, which cannot be represented by a time-use survey. Value is a subjective judgment; it is very different from cost accounting. The first is a malleable opinion held by individuals with varying needs and self-interests; the second is a matter of objectively tracking where money is spent. In that 2002 report from NACUBO one sees this contrast. On page 9 they write, "This methodology was created to help individual institutions calculate the annual cost of providing an undergraduate education. . . . NACUBO never intended its Cost of College Project to address issues of value or quality." Then, when discussing Departmental Research (on page 27) they make an about face: "Several alternative proposals were considered, but NACUBO concluded that all departmental research costs should remain within instruction and student services. Departmental research is vital and has direct impact on the value and quality of instruction provided to students."

B. It is only fair to compare against a 40-hour workweek when accounting for the fraction of our paid time spent on teaching and teaching-related work. This is a cute argument but it is not at all in accordance with the terms of our hiring at a research university. Here is a long-standing policy statement at UC. "The Senate assumes that each of its members is devoting all his time and energies (his full 'working' time) to the University. Such service to the University includes varied types of activities, such as classroom teaching, conference with students, studying and writing, research, committee

work, administration, and public service. Members of the Senate who are not engaged in certain of those activities will naturally have more time for others.”

C. Are you crazy, Charlie? This would make Berkeley no different from an ordinary teachers' college. This represents the deep tribal belief among research faculty that academic research is not understood or appreciated by the general public; and if we have to acknowledge its cost, they will not pay for it. This will be discussed further in the next section.

Questions of Process and Consequences

There will undoubtedly be other opinions on all aspects of this topic. I strongly advocate a process of discussion and debate over how to do the calculations required by AB94 that involves all interested parties in a relatively open manner. It should be acknowledged that the results will have divergent implications for various UC constituencies: faculty, students, administrators. And the taxpaying citizens of California are entitled to a fair accounting.

It seems unavoidable that the outcome will leave UC leaders in an awkward position - having to acknowledge that it has been charging undergraduate students tuition that well exceeds the actual cost for UC to provide undergraduate education.

The fault lies in the previous leadership's unwillingness to talk openly about the cost of UC's research program, that which makes this the greatly admired institution, and only focusing on the costs of education, thus pushing all the bills onto the laps of students.

UC's research mission is a great public treasure, a great public resource, which needs to be cherished and nourished by all the people of California for the benefit of all the people of California.¹ It is the most important job of presidents and chancellors and regents to make that case before the citizens and their elected officials. That is a job that has been neglected in recent years – maybe because it was just easier to pass the costs on to students.

That should be fixed. I hope that the faculty will take a leading role in fixing that.

In addition to reshaping the discourse about appropriate levels of tuition and fees charged to undergraduate students, the correction of this bad old accounting habit should also lead to correcting some serious faults in the US Department of Education's IPEDS database that is relied upon by many researchers trying to measure and assess higher education. (Schwartz 2012)

¹ Janet Napolitano, the new President of the University of California system, has put it thusly: “‘Teach for California, research for the world’ is more than a slogan. It is what we do.”

References

(LeginfoCA 2013) http://www.leginfo.ca.gov/pub/13-14/bill/asm/ab_0051-0100/ab_94_bill_20130701_chaptered.pdf

(Morey 1930) Lloyd Morey, "University and College Accounting" (New York, J. Wiley & Sons, inc.; London, Chapman & Hall, limited) 1930

(NACUBO 2002) "Explaining College Costs: NACUBO's Methodology for Identifying the Costs of Delivering Undergraduate Education," (Washington, DC, February 2002). Posted at <http://socrates.berkeley.edu/~schwartz/Seminar/NACUBO2002.pdf>

(NRC 2012) National Research Council. (2012). *Improving Measurement of Productivity in Higher Education*. Panel on Measuring Higher Education Productivity: Conceptual Framework and Data Needs. Teresa A. Sullivan, Christopher Mackie, William F. Massy, and Esha Sinha, Editors. Committee on National Statistics and Board on Testing and Assessment, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

(Schwartz 2007) and (Schwartz 2013) A collection of my earlier papers on this topic is posted at <http://socrates.berkeley.edu/~schwartz/TopicCost.html>

(Schwartz 2012) See Charles Schwartz, "So you want to examine your university's financial reports?" Chronicle of Higher Education, February 7, 2012

(UC_Budget 2008) http://ucop.edu/operating-budget/_files/legreports/0708/uifta.pdf

(UC_Budget 2011) "UC Budget for Current Operations, 2012-13", page S-9

(UC_FR) This can be found at <http://www.ucop.edu/financial-accounting/financial-reports/index.html>

(UC_FTU 1984) This is posted at http://socrates.berkeley.edu/~schwartz/FacultyTimeUse_s.pdf

(UC_Regents 2013) Item F1 on the agenda of the July 17, 2013, meeting of the UC Regents' Committee on Finance, page 4

(UC_Regents 2013a) Item E1 on the agenda of the May 15, 2013, meeting of the UC Regents' Committee on Educational Policy, page 6

Appendix – Is that 30-year old data on Faculty Time-Use still accurate?

There is relevant information found in a series of reports from the University to the state legislature, titled, “Faculty Instructional Activities.” The latest such report is dated February 2008 (UC_Budget 2008) and in Tables 11 and 12 are data on Formal Instructional Activities by Regular Rank Faculty over a recent 15-year interval. Looking at undergraduate instruction they report the number of Primary Classes taught per Faculty FTE as being 2.5 quarter courses in 1990-91 and that same number in 2005-06, with numbers between 2.4 and 2.7 for the intervening years. Also shown are Independent Study Enrollments per Faculty FTE and there the numbers for undergraduate instruction are 3.8 in 1990-91 and 3.4 in 2005-06, varying between 3.1 and 4.9 in the intervening years. That indicates a static picture of professors’ average teaching load for undergraduate instruction over a substantial interval of time. The data in that report for graduate instruction show some changes, with the count of Primary Classes growing from 2.0 to 2.6 and the Independent Study Enrollments declining from 11.8 to 10.4.

In that same report, they refer to the data cited above as derived by the “Old Methodology” for measuring faculty instructional activity and they also show some recent data derived by what they call a “New Methodology” that provides a way to combine all types of courses into a single effective number of classes taught. Their data of this new type extends only over a very few recent years and so is not useful in passing judgment on changes from 30 years ago – except for one particular item, namely the division of faculty teaching activity between undergraduate and graduate courses. The 30-year old Time-Use Survey gave a ½ to ½ split between professors’ work-time spent in teaching (for both types of courses combined). This New Methodology for counting courses in recent years gives, in Tables 2 and 3, a different split: 3/8 for undergraduate classes and 5/8 for graduate classes. If one uses this new datum rather than the old one, then the figure I gave as 21% of faculty work time allocated to undergraduate education becomes 16%. My personal opinion is that the work-time measure is more appropriate for cost accounting than this new course-counting method; but others may see it differently.

Finally, in terms of assessing the current relevance of the 30-year old data, I should cite a report on Academic Performance Indicators delivered just over one year ago to the University of California Board of Regents from the UC Office of the President. (UC_Regents 2013a). There they had explicit and detailed discussion of the 1983-84 Faculty Time-Use Survey, they quoted the same data I have given in this paper, and reported that they believe that data is accurate today.