Campus Finance Committee Meeting

Date: December 16, 2021
Time: 9:00 AM

In Attendance

Elizabeth Watkins, Gerry Bomotti, Sally Tavizon (sub for Anil Deolalikar), Christine Mata (sub for Brian Haynes), Christopher Lynch, Peter Atkinson (in for Dana Simmons), Cindy Williams (sub for Daryle Williams), Maria Aldana (sub for Deborah Deas), Elysha Castillo (Student Rep), Jason Stajich, Jeff Girod, Jennifer Brown, Kathryn Uhrich, Kevin Vaughn, Louie Rodriguez, Mariam Lam, Melanie Wu, Peter Hayashida, Rodolfo Torres, Shaun Bowler, Steven Mandeville-Gamble, Yunzeng Wang, Ken Baerenklau (guest), Scott Heil (guest) and Stephanie Flores (committee support)

Credit Weighting Project for Delaware Study – Scott

Presentation and Pre-meeting documents attached

Background: A Credit Weighting Committee made up of Faculty and CFAOs recommended that UCR join the Delaware Study which looks at the cost of instruction per student FTE at various higher education institutions across the county.

Delaware Study Overview: 120 institutions participate, 20-25 are R1 institutions, based on FY19-20 expenses

Key points on IR Analysis

- College/School data has been made as uniform as possible using CIP codes and definitions in the Delaware Study
- How do we identify our peers? Ranked all the R1 by the following variables: academic, demographic, financial ratios, pell percentage, etc.
    1) 3 sister campuses became the top peers based on the measures chosen which validates the methodology
    2) Adding Pell percentage distanced us from the some of the universities we would expect to be our peers
    3) Committee recommended taking the top 10 of our Delaware, but IR expanded to top 20 to help cover the various disciplines at UCR, went 49 deep into the 120 participating institutions and it expanded to R1 and R2 institutions
- Salaries and teaching loads will impact the outcomes and there isn't the ability to get into the details at other peer institutions. Used the salary data comparisons in the Oklahoma State study to validate the costs we included in the Delaware study
- SPP didn't have enough samples so the results needed to be widened
- CNAS data was run with and without the OR/AES expenses. The output without that data looked really strange (and verified with Oklahoma State data), so we included the salary/benefit expenses from OR/AES in instruction

- All students were included not just undergrads because the intent is to apply the weights to both FTE and Headcount.

Review of the various method options (none are perfect)

1 – most straight forward, but lacked good matches

2 – same as #1 but adjust the peer data for the student (grad/UG) mix and faculty mix (tenure/non-tenure)

3 – started from square one and looked for matches with related CIP codes and used the averages (preferred method for ease of implementation)

4 – twist on #3 medians instead of averages

5 – twist on #3 midpoint between 25th and 75th percentiles instead of averages

Discussion – all attendees

Credit Weighting Committee report – this is a lot of work for a little bit of result if it only applies to the increment. Based on feedback it is understood that people were uncomfortable with the subvention at the start of the model, so do we need to look at how funding is allocated to colleges/schools.

This data suggests that there is a variableness to the cost to educate students within colleges and schools.

Do you want to model what any of these weight models will look like in the tuition increments to understand that impact to each college/school? Do we want to model the weights to both tuition increments and subvention? Yes – they will return with 2 models to take run through the model.

Action Items

1. CFC members will review the information with their colleagues and come back to our next meeting with their top 2 models.

2. IR will apply the selected rates to UCR FTE and headcounts and provide the data to FP&A.

3. FP&A will use the weighted FTE and headcounts to model the tuition allocation and to evaluate the subvention.

Next Meeting

Thursday, January 13 @ 9am

UC RIVERSIDE
Institutional Research

PEER INSTITUTION INSTRUCTIONAL COST RESULTS

AGENDA

- Review committee work
- Overview of Delaware data
- Peer Identification
- Peer matching methods
- Comparison of results

OVERVIEW OF DOCUMENTS

Exhibit 1

General background on the Delaware Cost Study

Exhibit 2

Peer institution ranking method

Exhibit 3

Explanation of cost methods

Exhibit 4

Comparison of cost method results

Exhibit 5

Detailed results from one method

Exhibit 6

List of 20 peers matched for costs

Exhibit 7

Student-faculty ratios

AD HOC COMMITTEE RESULTS

- Recommended joining the Delaware Cost Study
- Proposed a composite weight that would be the midpoint between UCR and peer average
- Weights relative to CHASS
- Weights to be applied to new growth in FTE

CHANGES SINCE THE COMMITTEE REPORT

More recent data

Delaware results and UCR comparisons are all from 2019-20

Closer definitions

Delaware had specific definitions that varied from those of the committee, e.g., research and individual study FTE

Common data source

FP&A calculated the expenditures in a uniform way for each department

DELAWARE DATA OVERVIEW

- About 120 total institutions were available in this round, <25 R1s
- Department instructional costs and FTE are reported by 4-digit CIP code
- Individual institution data is not available; samples must be >=5 institutions to see results

PEER SIMILARITY RANKING

- Started with all public R1s
- Simultaneously match on a range of academic, demographic, and financial measures
- Santa Barbara, Irvine, and Davis come out as top peers
- Pell % is one of the key variables that makes UCR unique

EXAMPLE OF PEER RANKS

Overall Similarity Rank	Overall Similarity %	AAU Member	Delaware Cost Study Member	UC System Peers	UIA Member	School Name	% Admitted	% Freshmen Awarded Pell Grants	Endowment Per Student FTE	Total Enrollment	% Enrollment Yield
0	100.0%	0	1	0	1	University of California-Riverside	51%	51%	$7,409	23,922	18%
1	79.6%	1	0	0	0	University of California-Santa Barbara	32%	33%	$9,524	25,976	17%
2	39.1%	1	1	0	0	University of California-Irvine	29%	34%	$12,779	36,032	21%
3	34.4%	1	0	0	0	University of California-Davis	41%	32%	$12,748	38,167	20%
4	31.1%	1	0	0	0	University of Oregon	83%	28%	$42,124	22,644	20%
5	28.2%	0	0	0	0	New Jersey Institute of Technology	64%	35%	$13,264	11,423	25%
6	18.6%	0	1	0	0	University of Southern Mississippi	98%	50%	$8,739	14,509	25%
7	18.2%	0	0	0	0	Louisiana State University and Agricultural & Mechanica	74%	29%	$19,789	30,983	32%
8	16.6%	0	0	0	0	University of Houston	62%	44%	$22,008	46,324	37%
9	15.8%	1	1	0	0	University of California-Santa Cruz	47%	28%	$5,510	19,700	14%
10	15.5%	0	1	0	0	Binghamton University	40%	28%	$6,688	17,768	19%

APPLYING PEER LIST ON DELAWARE DATA

- Our preferred top 10/20 were not well represented in current Delaware participants
- We chose the top 20 available, which went down to #49 on our ranked list (see Exhibit 6 for the names)
- SPP and other units did not always have sufficient sample, so at times we had to expand to all R1s and R2s in order to get results

PEER MATCHING METHODS

- Methods 1-5 test different assumptions and the sensitivity of results to changes in method
- Each has its trade-offs, but in general we prefer fewer transformations and arbitrary weighting or matching assumptions
- Based on this, Method 3 seems to capture the best representative costs without imposing too many assumptions on the data

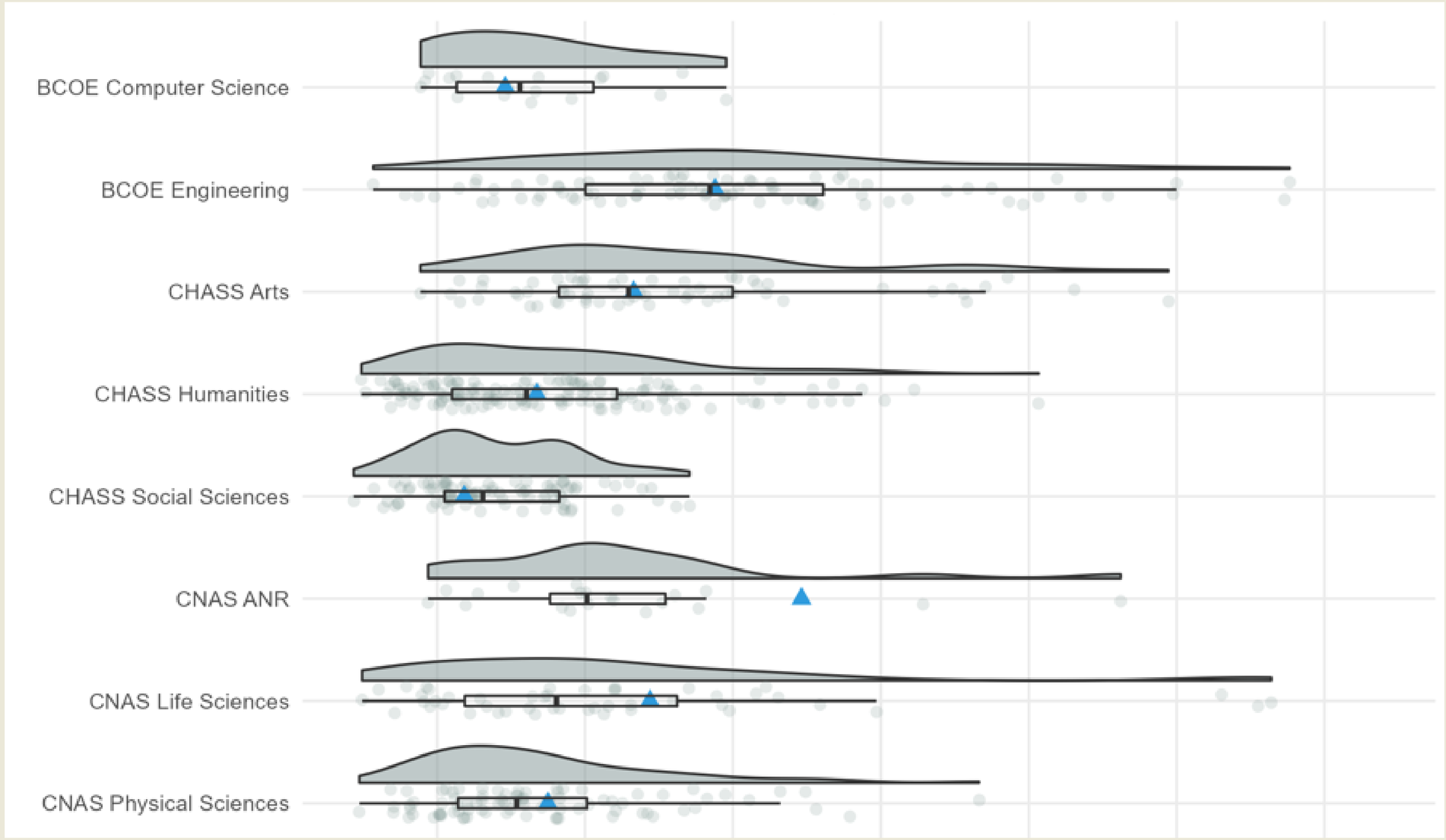
COMPARISON OF RESULTS

Comparison of Peer Institution Instructional Cost Estimation Methods

Updated 12/9/2021

			Estimated Cost Per Student FTE						Relative Weight					
	Peer Estimation Method	Description	CHASS	BCOE	CNAS	Business	SOE	SPP*	CHASS	BCOE	CNAS	Business	SOE	SPP*
1	**Department averages by best-matching CIP**	Every department is matched, supplementing R2s and/or broader disciplines for small departments. Small and specialized departments may not be adequately matched.	$8,490	$11,499	$8,486	$7,548	$11,512	$14,742	1.00	1.35	1.00	0.89	1.36	1.74
2	**Adjusted department averages by best-matching CIP, controlling for graduate student and tenured faculty mix**	Same as above, but tries to control for peers that have a much different mix of graduate or undergraduate enrollment in the matched department along with the share of instruction by tenured faculty	$7,447	$11,656	$11,163	$6,425	$10,062		1.00	1.57	1.50	0.86	1.35	
3	**College-focused averages for all related CIPs**	Instead of trying for 1:1 matches on department, this option tries to pull together whole families of disciplines that are broadly similar to those in each UCR school/college.	$8,514	$11,755	$9,346	$7,952	$11,512	$15,101	1.00	1.38	1.10	0.93	1.35	1.77
4	**College-focused medians by best-matching CIP**	Similar to the college-focused method, only using the median rather than the average in case any peers have extreme values that would pull the average much higher or lower.	$7,771	$11,175	$8,315	$6,874	$11,331	$15,315	1.00	1.44	1.07	0.88	1.46	1.97
5	**College-focused midpoint between 25th and 75th percentile of peers in best-matching CIP**	Similar to the medians method, but based on the interquartile range to better reflect what is typical for the middle 50% of peers.	$8,277	$11,155	$8,646	$7,229	$11,500	$14,754	1.00	1.35	1.04	0.87	1.39	1.78
		UCR Instructional Cost	**$7,603**	**$11,027**	**$10,693**	**$7,273**	**$7,433**	**$18,203**	**1.00**	**1.45**	**1.41**	**0.96**	**0.98**	**2.39**

EXAMPLE DISTRIBUTIONS



DISCUSSION AND NEXT STEPS

Overview of the Delaware Cost Study Data

Background
The National Study of Instructional Costs and Productivity, or Delaware Cost Study, administered by the University of Delaware since 1992, provides participating postsecondary educational institutions with aggregated comparative data on teaching loads and instructional costs at the academic discipline level. Only institutions that submit their complete data can access the comparative information. Approximately 120 institutions are participating in the current data collection cycle and some 700 have participated since the study's inception. Past participants within the University of California system include Irvine, Santa Cruz, and Merced. UCR's first participation was in 2021, and it covered the 2019-20 academic year.

Scope of coverage and data limitations
Instructional costs are reported for each academic discipline (e.g., Psychology, Chemistry, Computer Science) based on the Classification of Instructional Programs (CIP) code associated with the discipline. Costs for a given department can be compared with aggregate figures for departments of the same academic discipline at a set of peer institutions. Student FTE figures are included and can be used to construct per-student cost averages. Other attributes of the program such as faculty FTE, percentage tenured/tenure-track, and the percentage of graduate students enrolled are also available for comparison and analysis.

By Delaware policy, individual institution records cannot be ascertained and in general a peer group must include at least 5 participating institutions in order to receive results. In practice, this means for certain smaller or less common programs, there may not be enough institutions represented among UCR's preferred peer group and a wider sample of R1/R2 universities was used instead.

Defining UCR's peer group
The Institutional Research office, in collaboration with the Provost's office, defined in 2021 a multivariate method for identifying a national peer group of public R1 institutions. The variables included a wide range of academic, demographic, and financial measures, including graduation rates, percentage of Pell recipients, and endowment dollars per student FTE. More information on this method and the specific institutions is provided in a separate attachment. The intention was to take the top 20 peers according to the numeric similarity ranking. However, because less than half of R1 institutions participate in the Delaware study each year, the top 20 used for this report contains most of the participating R1s and it is not the same as our ideal peer list. In the Delaware subset, it was necessary to go to No. 49 on the overall peer list in order to reach 20 participating peers.

Regional differences in costs

Most of the R1 schools represented in the resulting Delaware peer group are outside California and many are in lower-cost regions of the country. This could be a concern if some of those were overrepresented in certain academic disciplines and underrepresented in others. There is no easy way to verify this because of Delaware's data use constraints, but on its face this type of skewness seems somewhat unlikely once programs are rolled up to the college level. UCR's intended use of a relative weighting scheme (i.e., CHASS = 1.0) should substantially reduce the chances that regional cost-of-living differences would distort the interpretation of cost differences in the national peer group.

Data preparation

Data preparation and distribution were handled by UCR Institutional Research in collaboration with Financial Planning & Analysis. Additional details about the process and the information available can be obtained from the IR office.

Comparison of Peer Institution Instructional Cost Estimation Methods

Updated 12/9/2021

			Estimated Cost Per Student FTE						Relative Weight					
	Peer Estimation Method	Description	CHASS	BCOE	CNAS	Business	SOE	SPP*	CHASS	BCOE	CNAS	Business	SOE	SPP*
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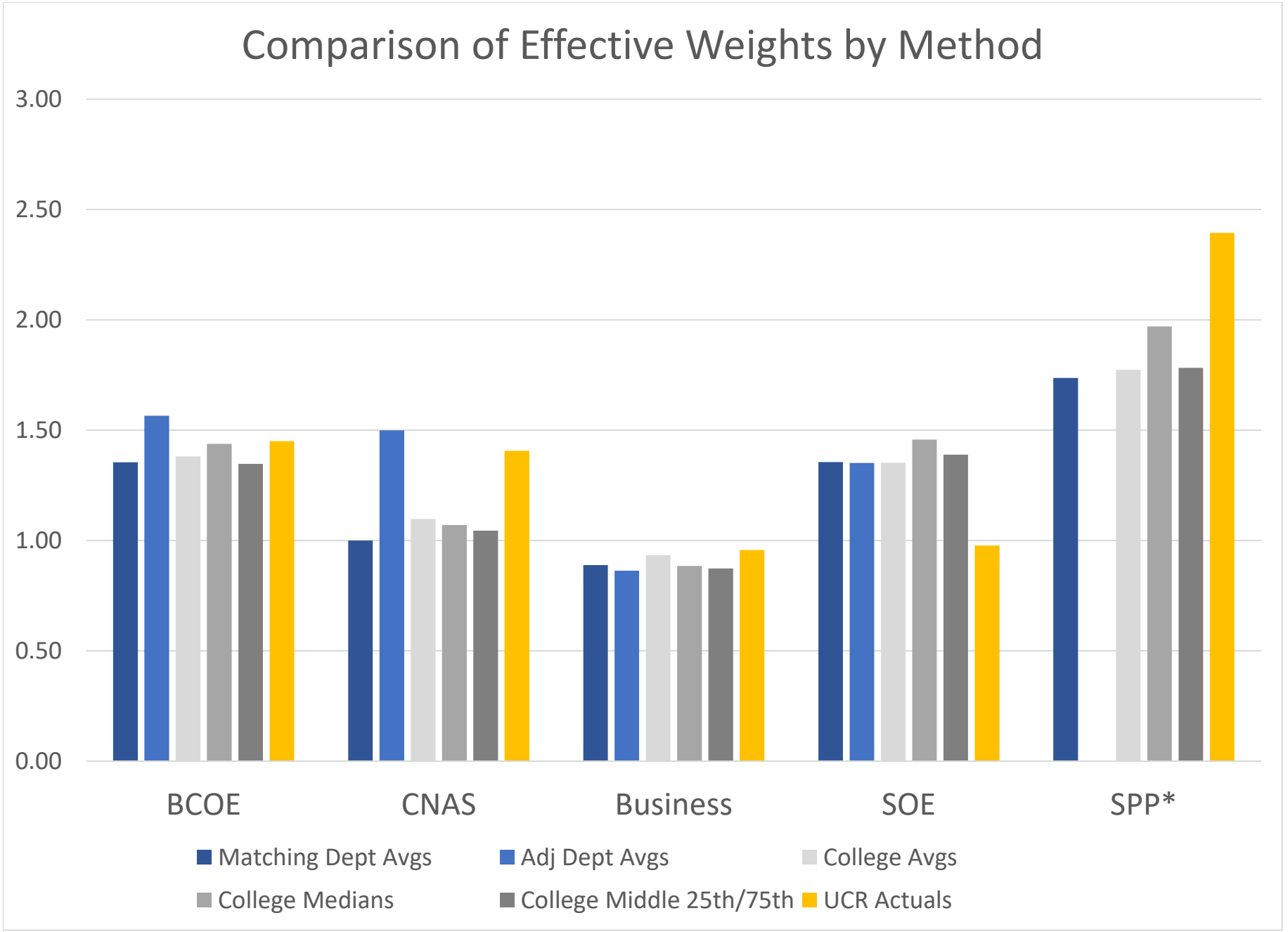
		UCR Instructional Cost	**$7,603**	**$11,027**	**$10,693**	**$7,273**	**$7,433**	**$18,203**	**1.00**	**1.45**	**1.41**	**0.96**	**0.98**	**2.39**

All data are based on the Delaware Cost Study for the 2019-20 academic year. The peer list consists of the 20 best-matching participating R1 universities.

Note: All methods use a weighted average by CIP code based on UCR student FTE to arrive at the college total.

*Some of the methods could not be replicated for SPP due to the small sample of institutions in the peer data source.

The shaded row is the method recommended by UCR Institutional Research. See attached the discussion for details.


Comparison of Effective Weights by Method
3.00
2.50
2.00
1.50
1.00
0.50
0.00
BCOE
CNAS
Business
SOE
SPP*
Matching Dept Avgs
Adj Dept Avgs
College Avgs
College Medians
College Middle 25th/75th
UCR Actuals

UC RIVERSIDE
Institutional Research

Delaware Cost Study 2021
Cost Details for Peer Averages (Method 3)

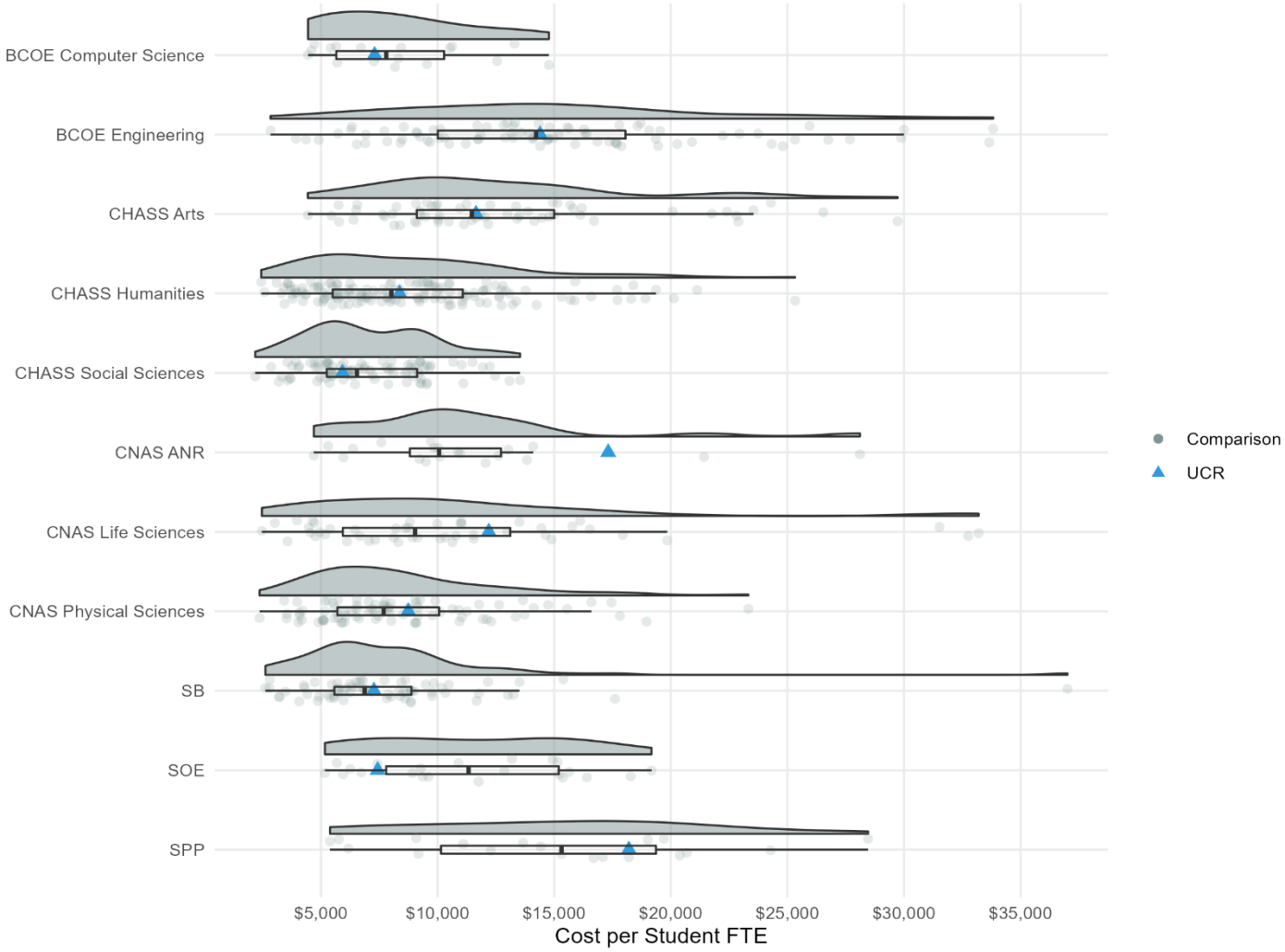
The following are results by college and discipline area based on peer comparison Method 3.

School / College	Discipline Area	Peer Sample Size	UCR FTE Students per Year	UCR Instructional Cost per Student	Peer Average Instructional Cost per Student
BCOE	Computer Science	18	1,510	$7,300	$8,234
	Engineering	84	1,669	$14,397	$14,940
	Total			**$11,027**	**$11,755**
CHASS	Arts	61	1,513	$11,647	$12,774
	Humanities	145	3,667	$8,370	$8,821
	Social Sciences	90	5,312	$5,921	$7,089
	Total			**$7,603**	**$8,514**
CNAS	Agricultural and Natural Resources	20	972	$17,318	$11,269
	Life Sciences	48	1,551	$12,198	$10,759
	Physical Sciences	86	4,506	$8,746	$8,445
	Total			**$10,693**	**$9,346**
Business		69	2,105	$7,273	$7,952
SOE		22	1,023	$7,433	$11,512
SPP		19	176	$18,203	$15,101

A graphical representation of where each UCR discipline group fits in the cost distribution of peer institutions is provided on the next page.

UCR versus Peer Costs by Discipline Area

The following histograms show the range and typical values for cost per student by discipline area. UCR values for each area are designated by the blue triangle.



Notes

The SOE comparison group includes departments from participating R1s/R2s reporting CIP 13.01 (Education, General).

SPP's comparison group includes departments from participating R1s/R2s reporting CIPs 44.04 (Public Administration)/44.05 (Public Policy Analysis).

All other comparison groups are based on the top 20 peer institutions participating in the study.

UC RIVERSIDE Institutional Research

Delaware Cost Study 2021
Top 20 Participating Public R1 Peer Institutions

The following 20 institutions were used as UCR's peer group for most of the peer cost data presented when sufficient sample sizes exist. For a handful programs, it was necessary to use a wider public R1/R2 institution list in order to meet the minimum sample. For further reference, see the separate document describing the peer similarity metric used to rank peer institutions.

Auburn University
Clemson University
Colorado State University
Mississippi State University
North Carolina State University at Raleigh
SUNY - Binghamton University
SUNY - University at Buffalo
University of Arkansas - Fayetteville
University of California - Irvine
University of California - Santa Cruz
University of Connecticut
University of Delaware
University of Massachusetts - Amherst
University of Mississippi
University of Missouri - Columbia
University of New Hampshire
University of South Florida
University of Southern Mississippi
University of Tennessee - Knoxville
Virginia Polytechnic Institute & State University (Virginia Tech)

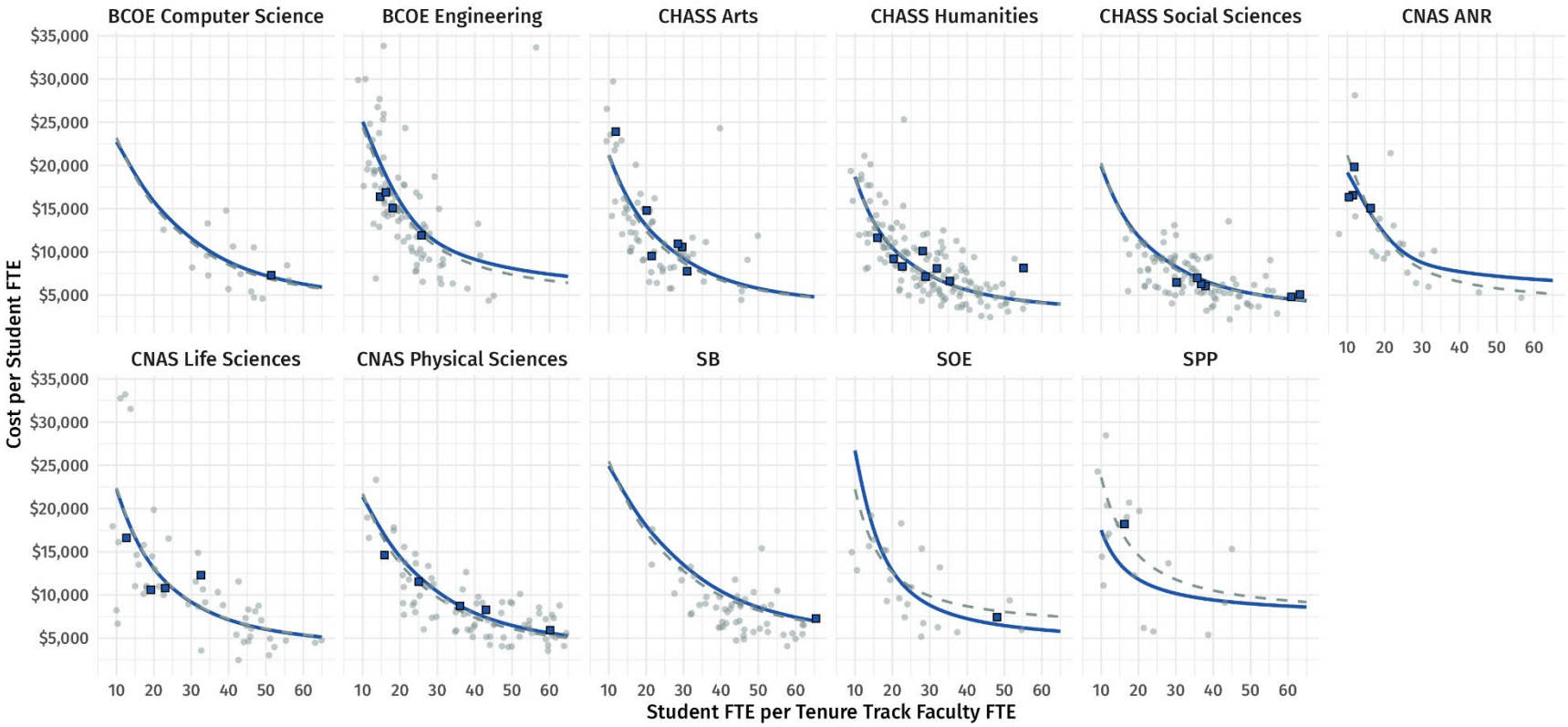
UC RIVERSIDE
Institutional Research

Delaware Cost Study 2021
Comparison of Student-Faculty Ratios by Discipline

The table below shows the ratio of annualized student FTE to tenured/tenure-track faculty FTE by the same groupings used in the Delaware college averages peer method.

School / College	Discipline Area	UCR Student to Tenure-Track Faculty FTE Ratio	Peer Institution Student to Tenure-Track Faculty FTE Ratio
BCOE	Computer Science	51.4	45.1
	Engineering	19.2	27.4
BCOE Total		**34.5**	**35.8**
CHASS	Arts	23.9	22.5
	Humanities	28.2	34.7
	Social Sciences	42.8	36.7
CHASS Total		**35.0**	**33.9**
CNAS	Agricultural and Natural Resources	12.9	24.4
	Life Sciences	21.3	32.2
	Physical Sciences	35.5	42.6
CNAS Total		**29.2**	**37.8**
Business		65.4	57.0
SOE		48.0	24.8
SPP		16.2	22.9

The plots below show the modeled relationship between SFR and cost for both UCR and the Delaware peer departments.



The fitted lines represent the model-predicted value. The dashed grey line shows the predicted cost per student FTE as a function of student-faculty ratio, with all other model covariates held constant at the benchmark comparison group averages. The solid blue line shows the predicted cost per student FTE as a function of student-faculty ratio, with all other model covariates held constant at the UCR subject group averages.

UC RIVERSIDE

Office of the Provost and Executive Vice Chancellor
900 University Avenue
4148 Hinderaker Hall
Riverside, CA 92521

February 10, 2021

To: Deans of the Schools and Colleges
Professor Jason Stajich, Chair of the Riverside Division

From: Tom Smith, Interim Provost & Executive Vice Chancellor
Gerry Bomotti, Vice Chancellor for Planning, Budget & Administration

Re: Proposal to modify tuition weights for teaching workload in the UCR budget model

Background

UCR's current budget model allocates a portion of undergraduate tuition to each school/college (hereafter referred to as "colleges" for simplicity) based on (1) total undergraduate student credit hours taught by instructors with home departments in the college, and another portion based on (2) total undergraduate student headcount in the college's majors. The model also allocates a portion of graduate tuition based on (3) total state-supported Master's student headcount in each college. Allocations (1) and (3) are intended to cover teaching workload, while allocation (2) is intended to cover other costs associated with supporting undergraduate students such as advising.

In January 2019, following a campus-wide review of the budget model, we issued to the Chancellor our recommendations for adjustments to the model to address multiple concerns that had arisen since its implementation in July 2016. Among those recommendations were establishing non-uniform weights for the undergraduate and graduate teaching workload allocations described above. Currently we use uniform weights, which means, for example, that an undergraduate credit hour taught (or graduate student enrolled) in CHASS receives the same amount of tuition revenue as an undergraduate credit hour taught (or graduate student enrolled) in BCOE. However, costs of instruction vary across disciplines, so this uniform treatment is producing persistent under-funding of some units and making growth financially infeasible because the cost of adding additional students exceeds the revenue.

The Ad Hoc Committee on Credit Hour Weights was formed to investigate and make recommendations as to whether the campus should develop non-uniform weights for teaching workload that more closely align with disciplinary costs as well as level of instruction. The committee submitted its report on March 13, 2020. Shortly thereafter, the COVID-19 pandemic and associated financial challenges became the top priority for the campus budget office but recently we have returned to the committee's report. This proposal to modify the undergraduate credit hour weights closely follows the committee's recommendations, and also adopts a similar approach for state-supported Master's headcount.

Ad Hoc Committee Recommendations

As detailed in their full report (attached), the committee considered multiple approaches to developing evidence-based non-uniform undergraduate credit hour weights. Two approaches emerged as most preferred. One utilizes UCR data and one utilizes data from other campuses that has been compiled by the Delaware Cost Study. The results are shown as "UCR Weights" and "Delaware Weights" in table 1.

The committee considered that the UCR weights describe our costs as they are today but not necessarily what our costs should be, and recommended against allocating resources solely based on the UCR weights. The Delaware weights provide a useful external benchmark, so the committee instead recommended averaging the UCR and Delaware weights to produce the "Hybrid Weights (Undergrad)"

shown in table 1. In addition, to avoid abrupt changes in funding levels, the committee recommended applying the weights only to changes in undergraduate credit hours relative to FY20 (the fiscal year corresponding to the 2019-20 academic year).

Table 1: UCR, Delaware, and Hybrid Weights Normalized to CHASS

College	UCR Weights	Delaware Weights	Hybrid Weights (Undergrad/Grad)
BCOE	1.9	1.3	1.6/1.6
CHASS	1.0	1.0	1.0/1.0
CNAS	1.8	1.2	1.5/1.5
GSOE	1.7	1.3	1.5/1.5
Business	0.8	1.0	0.9/1.0
SPP	0.8	1.0	0.9/1.0

Proposal

We endorse the committee's recommendation to implement the Hybrid weights on changes in undergraduate credit hours relative to the FY20 baseline. We specifically propose to implement this new policy effective July 1, 2020 and to apply it to the change in total undergraduate credit hours relative to the FY20 total, and to use this approach going forward.

Consistent with the January 2019 recommendations to the Chancellor, we also propose adopting a similar approach for allocating the graduate teaching workload component of the budget model. This component includes tuition for Masters students in state-funded programs only and does not include any non-resident tuition or any additional professional degree supplemental tuition (PDST) charges. For this component, we propose using the committee's undergraduate Hybrid weights but increasing the weights for Business and SPP to 1.0. These weights are shown in table 1 as "Hybrid Weights (Grad)." This adjustment reflects our intuition that the true cost of graduate instruction is at least as large as the cost of undergraduate instruction in each of our schools and colleges. We plan to examine this more closely with regular reviews and updates to these weights as described below. This new policy also would become effective July 1, 2020 and would be applied to the change in headcount relative to FY20 totals going forward. To help reduce financial uncertainty for schools/colleges planning to grow, we will establish the weighted dollar values per graduate headcount (for graduate enrollment headcount and FTE have been equivalent in the UC and at UCR) for each School and College prior to each fiscal year.

Going forward, we note that UCR has joined the Delaware Cost Study, which the committee also recommended. We will have full access to the data in the study later this year. We propose using data from peer institutions in the cost study to update both the undergraduate and graduate weights in FY22, with additional recurring updates on a three-year cycle. Before finalizing and implementing the changes after each update, we will consult with the Senate's Committee on Planning & Budget and submit the changes through the annual budget cycle for review by the campus Budget Advisory Committee and approval by the Provost and Chancellor.

Attachment

Report of the Ad Hoc Committee on Credit Hour Weights (March 13, 2020)

Report of the Ad Hoc Committee on Credit Hour Weights
March 13, 2020

Bruce Babcock, Professor of Public Policy
Ken Barish, Professor of Physics & Astronomy (Co-Chair)
Randolph Head, Professor of History; Chair, Senate Committee on Courses
Jean Helwege, Professor of Finance
Ryan Johnson, Principal Research Analyst, Institutional Research
Jason Rodriquez, Policy Analyst, Financial Planning & Analysis
Veronica Ruiz, Assistant Dean/CFAO, Bourns College of Engineering
Christian Shelton, Professor of Computer Science & Engineering
Patricia Springer, Professor of Botany & Plant Sciences
Tom Stahovich, Professor of Mechanical Engineering (Co-Chair)
Sally Tavizon, CFAO & Assistant Dean, Graduate School of Education and School of Public Policy
Cindy Williams, CFAO, College of Humanities Arts & Social Sciences

Overview

In fall 2018, the Vice Chancellor for Planning, Budget, and Administration and the Office of Financial Planning and Analysis, in collaboration with the Provost and Executive Vice Chancellor, began a campus-wide review of UCR's budget model. In January 2019, they issued to the Chancellor their recommendations for adjustments of the campus budget model. Among those recommendations was establishing credit hour weights for tuition workload calculations.

This ad hoc committee was formed to pursue this recommendation. Our task was to develop credit hour weights to be used in distributing tuition dollars associated with *growth* in credit hours. The tuition dollars distributed to a college for teaching a course will be *proportional* to the product of the credit hour weight for the course and the student FTE enrollment in that course. (For convenience, we use the term "college" to refer to a "college" or "school.") Note that the credit hour weights do not determine the amount of available dollars, but rather determine how the available dollars are distributed. In other words, the size of the pie is fixed and the weights will be used to decide the relative size of the slice distributed to each college. It is important to note that the weights will be used to distribute only those tuition dollars that represent growth beyond the undergraduate baseline enrollment. Uniformly weighted credit hours have played a role in budget distribution since 2016-2017. The committee recommends applying the proposed credit hour weights only for growth beyond the current budget year. Thus, the weights would affect the funds received by a college only if there was growth in enrollment. Continuing, with the analogy, the new weights would be used to distribute only growth in the pie beyond current enrollments.

The committee considered three models for weights including a model based on estimates of our current costs of teaching (or more precisely, what we currently spend on teaching) at UCR ("UCR model"), a model developed at the University of Delaware ("Delaware model"), and the Biannual Texas Costing Model ("Texas model"). After examining the strengths and weaknesses of these models, we

developed a hybrid model which is a combination of the UCR and Delaware models. The UCR model reflects our current costs of teaching, while the Delaware model is a result of a national study of instructional costs, and thus reflects national average costs of teaching. (The Delaware model we used includes limited granularity because we are not participants in the study.) Thus, by combining the UCR and Delaware models, we obtained a model that considers both what it currently costs to teach our courses and the average of teaching costs at other comparable universities. We refer to our final model as the "Hybrid UCR model." By contrast, UCRs current budget model does not consider the cost of teaching at all but rather gives an equal credit hour weight to each course.

The Hybrid UCR model provides a single credit hour weight for each college, reflecting the average cost of teaching a course in that college. These weights are intended to be a short-term solution that are valid only as long as the distribution of enrollment in the various types of courses – lower division courses, upper division courses, graduate courses, large lecture courses, lab courses, studio courses, etc. – remains relatively constant within each college. **As a long-term solution, the committee recommends that UCR participate in the Delaware Study of Instructional Costs & Productivity to obtain more data regarding benchmark teaching costs at comparable universities.** This would result in a new more rigorous model of credit hour weights that would replace the model proposed now.

This report includes: a general overview of credit-hour weighting, including challenges, benefits, and risks; descriptions of the UCR, Delaware, Texas, and Hybrid UCR models; a description of how a credit hour weighting model could be applied to distribute tuition; and a retrospective analysis that illustrates the potential effects of the Hybrid UCR model by applying it to historical data.

General Considerations

a. Diverse credit-hour weighting systems, and the challenges to calculating teaching costs at UCR

The committee reviewed a number of credit-hour weighting systems at universities around the United States, such as the Texas funding model, and learned that such systems operate in different ways in different systems. We also worked intensely with the UCR Institutional Research (IR) staff to build a cost-of-teaching model at UCR. Through this work, it became abundantly clear that there is no simple and objective way to determine the cost of teaching at the credit-hour level. Rather, every model depends critically on specific decisions about how to allocate different kinds of costs, particularly fixed costs, and there is no *a priori* way to do so. Institutional context (including units of aggregation chosen for costs and budgeting, as well as sites of decision-making about various cost factors), along with particular cost-allocation choices, will directly affect the outcomes of using credit-hours to allocate funding to units.

The committee discussed the following elements as important in any system that allocates all or part of available funds on the basis of credit-hours that are weighted according to teaching costs: (1) the level at which funding is controlled by credit-hours, e.g., state funding for an entire system, funding of a single campus, or funding of units within a campus; (2) the way that fixed costs such as faculty salaries and infrastructure are included in cost calculations; and (3) the alignment between the incentives that a credit-hour funding system creates, on the one hand, and those who make decisions on cost issues, on the other. Our general conclusion is that <u>if</u> credit hours are used as one metric for the allocation of funds to teaching units, then it makes sense to apply evidence-based weighting to credit hour calculations. Equally, though, the way weights are calculated and the extent of funding streams controlled by weighted credit-hours should be consciously designed to reflect the particular context of UCR.

(1) Many US public university systems use credit hours as one metric in allocating funds, and most of them use some kind of weighting. This includes the UC system as a whole, in which benchmarking of state funds to campuses is weighted by the difference between undergraduate, graduate, and medical school credit hours or FTE, among other factors. In the Texas system, which offers an unusually comprehensive and regularly-updated set of credit-hour weightings, these weightings and credit-hour totals operate primarily to guide the Texas state legislature as it funds the campuses of a large system that includes many heterogeneous units, from R1 flagships to specialized professional schools. The Texas system determines each campus units' funding, but internal distribution of the resulting funding stream is not necessarily controlled by the same credit-hour metrics, to our understanding.

For UCR, the following structural considerations are relevant: the source of funds subject to credit-hour metrics will be the growth in tuition and state funds after implementation of this weighting plan. The committee did not consider creating a model suited for allocating all undergraduate tuition and state funding on the basis of credit-hours. At the moment, and in the committee's recommendations, the unit of allocation of funds should be the college. These choices mean that credit-hour weightings based on different architectures (as in Texas) are not directly transferable to UCR, though broad-based evidence, such as that from the Delaware study's R1 cohort, can be used to provide an external and market-based benchmark for assessing UCR's current, historically-based cost structure.

(2) To create the UCR model laid out in this report, the committee had to make a number of decisions about how to allocate the costs that the University incurs in its operations. Significantly, the operation of a large R1 university involves a very high proportion of fixed costs, including infrastructure costs for buildings and classrooms, multi-year faculty careers with salary growth not dependent on credit-hours taught, graduate programs with their own complex funding dynamics, and a large research enterprise with its own funding structure. There is no *a priori* way to decide how much of such fixed costs to use in calculating absolute or relative teaching costs for various units: choices must be made that are, ultimately, somewhat arbitrary. An overview of the choices the committee made is provided in the section below. These choices represent the committee's good-faith effort, bolstered by examining alternatives at each step, to create a reasonable evidence-based assessment of undergraduate classroom teaching costs, but other choices are possible and would lead to different proposed credit-hour weightings.

(3) The committee's charge was also to devise a set of credit hour weights, if possible, that were incentive-neutral: that is, the weights proposed should not in themselves create any incentives, whether strategic or operational. The system is not designed to lower the net cost of teaching courses at UCR, for example, nor to favor some fields or disciplines, nor to respond to UCR 2020 or the pending new strategic plan. Nevertheless, any mechanical system of allocating funds – such as a credit-hour system, whether weighted or unweighted – creates incentives. Faculty, chairs, and deans will rationally seek to optimize their units' operations on the basis of the funds they can expect, and their actions create potential moral hazards, as discussed in the next section. The current system of budget allocation to the colleges, which distributes tuition and state funds representing growth since the new budget system was implemented, is widely believed to have already affected colleges' strategies in regard to undergraduate teaching.

It is therefore essential that as UCR refines its use of credit-hours as a budgeting metric, we should take care that implicit incentives are aligned with decisions on cost factors in teaching. This is a complex matter. For example, chairs exercise primary responsibility for setting class sizes and teaching assignments (as provided in the APM), but deans control the resources needed for temporary teaching funds, Teaching Assistants, and other teaching-related expenses. Deans have primary control over faculty hiring, including allocation of lines and decisions about hiring levels and salaries, but in doing so, bind departments to multi-year expenditures that cannot respond to shifting student preferences expressed in credit hours taken. The cost of Teaching Assistants, finally, is driven in part by student choices among majors, and in part by Senate decisions about general education requirements, even though the Senate has no control over funds needed to provide Teaching Assistants. Additionally, the optimization of class sizes can be limited by classroom availability. After lengthy discussion, the committee was unanimous that colleges are the most suitable unit for aggregating teaching costs and for allocating funds for teaching, including those based on credit hours. This choice balances between excess granularity (such as giving departments funds directly based on their credit hours, which might trigger zero-sum competition for students between departments) and excess centralization (such as leaving all funding of teaching to the central administration, which lacks close knowledge about how best to balance the inevitable cross-subsidies that any cost-based system entails). Deans are best placed to balance many competing demands for funds, and to collaborate with departments in structuring and funding their teaching as part of the larger college enterprise.

b. Benefits and risks of using cost-based models for income distribution at the campus level

Two objectives will be met by moving from the current system that distributes some proportion of tuition funds based solely on credit hours taught to one that differentially weights credit hours taught, with higher weights given to courses that cost more to teach. The first is a reduction in the specific moral hazard that arises under the current system of equal weights. The second is to reduce the need for annual funding flows from central administration to departments and colleges that have higher-than-average teaching costs, which are not accounted for by the current system. The value of these benefits should be weighed against the possible downside risks of using cost-based credit hour weights.

Any use of credit hours – whether counted equally or weighted – as a basis for budgetary decisions reduces the role of strategic decision-making. If a substantial part of teaching-unit budgets comes from credit hours, then program funding will decrease for some programs, departments, and colleges while increasing for others solely on the basis of student enrollment decisions, rather than on meeting strategically important institutional objectives of UCR. Moving to a system of weighted credit-hours from a system of equally-weighted credit hours will change the distribution of budget resources in a way that may or may not better align with institutional objectives. A second risk common to every method for using credit hours to distribute funds is the potential to create moral hazards, in that units may be tempted to choose teaching strategies for purely budgetary reasons. Changing the weighting scheme from equal weights to cost-based weights will shift the specific incentives at work.

Available empirical evidence shows that per-credit-hour teaching costs vary widely across courses. The primary drivers of teaching costs are instructor salary, instructor teaching load, and class size, with non-personnel costs also being important for some courses (Hemelt, Stange, Furquim, Simon, and Sawyer

(2018)). Some of these factors are controlled by deans, some by chairs, some are the result of long-term path-dependent decisions, such as faculty hiring and infrastructure investments, and others are determined by market forces external to the University.

The current system of distributing tuition funds based on credit hours taught creates an incentive for departments and colleges to maximize the number of credit hours taught while minimizing per-class instructor costs. With the current system, large classes taught by lower-cost, non-tenure-track faculty will maximize tuition revenue generation. The current system disincentivizes teaching lower-attendance classes taught by higher-salaried professors. These incentives do not imply that departments and colleges will not teach any high-cost classes, because they are needed to ensure educational quality. Rather, these incentives mean that colleges will tend to favor more low-cost classes and fewer high-cost classes than they would if they made such decisions based exclusively on educational quality. Furthermore, departments and colleges that ignore the incentives created by the current system will need continuing financial support outside the budget formulas to remain financially viable. A movement away from the current system of equal credit hour weights to weights that reflect teaching costs will reduce this moral hazard by better aligning financial incentives with educational objectives. This movement will also automatically increase the flow of funds to colleges with high teaching costs and reduce funds to colleges with low teaching costs relative to the current system of equal credit hour weights. This will, over time, reduce the need for continuing transfers of central administration funds that are needed to keep high-teaching-cost colleges financially viable. Relying on credit hours taught while ignoring real teaching cost differentials creates funding problems. If credit hours are going to be used to distribute tuition funds, then they should be weighted to reflect teaching costs.

Moving to credit hours weighted by teaching costs could raise different incentive problems, however, especially if the weights reflect actual per-course teaching costs at UCR and funds are distributed directly to departments. Suppose, for example, that the per-credit-hour costs for a course taught by a highly-paid professor with a very low enrollment were used to determine the credit-hour weighting for that course. The department would be pleased because reimbursement for the full cost of teaching that course would be received. Because many professors prefer to teach small-enrollment courses, there would be little incentive for departments, under such a system, to offer large, low cost classes, even where these would generate good educational outcomes at relatively low cost.

The design for any credit hour weighting system should therefore consider and avoid problems of poor or perverse incentives by carefully considering units of aggregation and decision, as discussed above. For the example above, allocating funding by college, rather than by course or department, could help forestall a departmental decision to teach only small courses, since colleges can hold departments accountable for meeting educational objectives while using funds efficiently. This is one reason why our committee recommends using colleges as the units of aggregation for credit hour weights and budgetary allocation. In addition, deriving base weights using an external benchmark of teaching costs rather than actual UCR teaching costs can also avoid improper incentives by benchmarking UCR's costs in relation to broad national cost data. Programs or colleges whose costs greatly exceed national benchmarks are likely to be operating less efficiently than they could be, on the whole, and the resulting high cost level should not be rewarded by additional funding. This is one reason why our committee recommends weighting credit hours by a measure that includes both UCR's actual costs and an external benchmark of costs.

Both logic and experience suggest two generalizations about cost-based budgeting in universities: (1) the larger the proportion of funds that are allocated by automatic mechanisms such as weighted credit-hours, the larger the incentives for units to game those mechanisms for budgetary rather than pedagogical reasons; and (2) the design of credit-hour weighting systems must attend closely to the units involved for aggregating costs, and relate these to the units that make teaching decisions, in order to avoid various possible moral hazard situations.

The Models

UCR Cost Model

The UCR Cost model was designed to assign a distinct cost of instruction to every course section that fit an intuitive definition of a "class." Although it was likely that the results would eventually be aggregated up to the college level for implementation in the budget model, it was worthwhile in the interim to analyze the data at various levels of aggregation to ensure the results made sense both in the context of expectations about UCR and when benchmarked against comparable results from other state systems. For brevity's sake, only the final analysis approach is presented here. While the details of the diverse interim analyses will not be presented here, it is worth mentioning that they occurred and were debated by the committee in the course of narrowing the method to something concise and actionable.

The course and instructor data underlying the model were, for the most part, constructed using the same method and data sources as the undergraduate workload FTE portion of the existing budget model. Departments were assigned to courses based on the instructors' pay department. All instructors (including teaching assistants/readers/etc.) recorded in Banner by the third week of each term were included, even in cases of team-taught courses. Cross-listed sections were unified. Self-supporting courses (i.e., courses with greater than 50% enrollment of students in self-supporting majors or courses taught by Palm Desert-paid instructors) were excluded. University Writing Program courses were also excluded.

Unlike the data used for undergraduate workload FTE in the existing budget model, the data for this model included graduate courses. There was much debate on this topic and good arguments on both sides, but ultimately, graduate courses were included for several reasons. Most importantly, they had to be included to make an apples-to-apples comparison to cost models from other states, which always included graduate courses in some fashion. The Delaware model in particular—the model used in combination with the UCR model to create the Hybrid UCR model—had graduate courses baked in in such a way that they could not be removed. The committee also determined that including graduate courses would give a more complete picture of the relative cost of instruction for each college, which was one of the committee's charges.

Because the goal of the model was to approximate the cost of "teaching," the following section types were excluded: Clinic (CLN), Colloquium (COL), Consultation (CON), Individualized Study (IND), Internship (INT), Practicum (PRC), Research (RES), Term Paper (TPA), Thesis (THE), Tutorial (TUT), and Written Work (WWK). These sections were excluded to avoid assigning instructional costs to what the committee agreed were commitments that were less like conventional teaching and more like supervisor/mentor/administrative/service/etc. roles—roles that were never intended to be part of this analysis.

Costs assigned to each course came in three categories listed in descending order of their magnitude: (1) instructor salaries, (2) department non-salary/non-benefit expenditures, and (3) support-staff salaries. Instructor salaries generally included only the instructional portion of a person's pay (e.g., an instructor with a 50% instructional appointment and a 50% administrative appointment would only show salary for the instructional portion), but an exception was made for faculty with research appointments (e.g., Agronomists), which were included. For ladder rank and similar full-time faculty, instructor salaries were allocated to sections by dividing each instructor's instructional salary for a given year among all the fall/winter/spring sections they taught in that year, weighting the allocation based on the number of credits typically assigned to each course. For other types of instructors (e.g., teaching assistants, part-time lecturers), salary was also allocated to courses based on the units conferred by each course, but on a quarterly rather than yearly basis. Sections without units (e.g., 0-credit discussion sections) were assigned placeholder units equivalent to contact hours.

Department non-salary/non-benefit expenditures (fund 19900 and function 40) were allocated proportional to student FTE in each section within a department. There was no overlap between these costs and the other two cost categories, as these costs were used for department expenditures unrelated to paying humans to teach (e.g., equipment/supplies used for instruction).

Support staff salaries included salaries for those who were not considered instructors but spent at least some of their time directly supporting certain courses (e.g., IT support technicians, lab assistants, academic coordinators, and musicians). These salaries were allocated to sections differently for each college based on the structure of data the colleges provided and the committee's input on reasonable allocation methods. BCOE's staff costs were provided at the college level and were allocated proportional to student FTE across all courses with a lab component. CNAS's staff costs were provided at the department level and were allocated proportional to student FTE across all courses with a lab component within a department. CHASS's staff costs were provided at the course level, so they were allocated in that way.

Once all costs had been allocated to each section, and interim analyses and a variety of potential methods were evaluated by the committee, the data were aggregated to the college level by summing up all student FTE and cost across the sections assigned to each college. Cost was then divided by FTE to create a measure of the cost per FTE for each college. Finally, each college's cost per FTE was divided by the CHASS cost per FTE to create a cost weight relative to CHASS. Table 1 shows the UCR calculated weights with and without graduate courses compared to the status quo weights of 1 which have been used to fund colleges since 2016-17.

The committee used data from the five-year period from 2014-15 to 2018-19 in its analysis. BCOE, CHASS, CNAS, and Business have been relatively stable over these five years in terms of the percentage of instructors in various categories, types of students enrolled, and courses taught. Thus, the committee is relatively confident that the weights for these colleges will remain relatively constant in the near future. In contrast, SPP and GSOE have evolved significantly in the last five years and will continue to evolve in the next five. New colleges are inherently more expensive until staffing, enrollment, and materials costs settle into a steady state, so SPP's calculated costs over the last five years are not a good representation of SPP’s steady-state costs. Because of this start-up transient, SPP's calculated weight was several times the size of that of any other college and would have dramatically skewed SPP's budget

if implemented. As a remedy, SPP's weight was set equal to that of Business. GSOE has also recently undergone significant change with the addition of a new undergraduate major. Because of this, the relative proportion of GSOE's cost categories over time will change. Nevertheless, GSOE's costs per student FTE has been stable enough and low enough that large changes are not expected in the near future. Consequently, the actual calculated weight was selected for GSOE. GSOE's calculated weight relative to other disciplines was comparable to the results in cost models from other states, which provides evidence that the GSOE calculated costs are reasonable for now.

Table 1. UCR Weights (cost / FTE) Relative To CHASS For 5-Year Period 2014-15 – 2018-19

College	Status Quo Weights In Current Budget Model	UCR Weights Relative to CHASS Without Grad Courses	UCR Weights Relative to CHASS With Grad Courses
BCOE	1.0	1.7	1.9
CHASS	1.0	1.0	1.0
CNAS	1.0	1.7	1.8
GSOE	1.0	1.6	1.7
Business	1.0	0.9	0.8
SPP	1.0	0.9	0.8

Delaware Model

The Delaware Cost Study aims to determine the cost of college instruction by collecting data from participating institutions. In 2018, over 700 universities and colleges provided data to the study, including approximately 60 public research universities. Each participant in the study pays an annual fee and is expected to provide data for its school. We note that current participants include UC Irvine and UC Merced. We recommend that UCR join this study at the earliest possible moment, as it allows for more careful analysis of the costs of teaching. In particular, members can choose 10 peer institutions to compare their data to, which would allow the committee to not only compare UCR costs to other research universities, but to research universities with similar demographics.

Hemelt, Stange, Furquim, Simon, and Sawyer (2018) use the data from the Delaware Study to analyze the costs of teaching. Their results indicate that the most important factors are instructor salary, class size, instructor workload and non-personnel expenses. Given the large variation in costs across disciplines found in their study, it is easy to conclude that using a credit hour weight of one for all courses is inappropriate. As an example, they state that compared to English, math courses cost 22%

less, due to higher class sizes, and electrical engineering costs 109%, due to both higher faculty salaries and small class sizes. We note that their study finds no trend in these cross-sectional differences in costs over the last 15 years.

Because UCR is not a participant of the study, this committee did not have access to the latest data or the most detailed data. However, we were able to find recent figures from the study on the costs of a large number of disciplines at research universities. These figures are what we refer to when we discuss the Delaware study. Given that Hemelt et al. do not find evidence of sharp differences over time, the committee feels that the figures we used are representative of the Delaware study and sufficient for the interim before UCR becomes a participant in the study.

Texas Model

The Texas model provides rich detail about calculated teaching costs at the University of Texas. However, the committee concluded that applying the model here at UCR would be impractical. It would require examining every course in the course catalog and assigning a Classification of Instructional Programs (CIP) code. Additionally, the Texas model relies on expensive accounting processes through which their costs of teaching are frequently reevaluated. Finally, our discussion with those with knowledge of the Texas model suggested that it operates primarily at the level of the state legislature in funding an entire system containing a wide variety of campus units. For these reasons, the committee does not recommend adopting the Texas model or its weightings.

Hybrid UCR Model

The UCR model described above reflects what it currently costs to teach a course at UCR – or more properly what we currently spend on teaching a course – and does not necessarily represent what it should cost to teach a course. Our current costs are a result of both strategic planning and historical accidents. For example, a shortage of large lecture halls and lab facilities has resulted in small class sizes which tends to increase costs. Conversely, a shortage of TA funds may result in courses with inadequate TA expenditures, thus making costs appear artificially low. Likewise, growth in a department can produce transients that have large effects on apparent costs. For example, if a program works to raise its profile by hiring several high-profile, and thus high-salary faculty, the apparent cost of teaching increases because of the high salaries. Similarly, a program that hires several faculty in anticipation of growing an undergraduate program will also appear to have elevated teaching costs.

For these reasons, the committee recommends against constructing credit hour weights solely based on our current costs of teaching. Doing so would reflect not only past strategic decisions and an ongoing process of budget negotiations and outcomes, but also a variety of historical accidents and transients. Instead, the committee believes that the weights must also consider what it *should* cost to teach our courses. The Delaware models provides national averages of costs and thus provides some indication of what it should cost to teach our courses. However, as we are not participants in the Delaware study, the Delaware model to which we have access does not explicitly consider any of UCR's unique characteristics. In short both the UCR Cost model and Delaware model provide imperfect models of our

teaching costs, but err for different reasons. Thus the committee recommends averaging these two models to provide a hybrid model that reflects both what our current costs are, and what those costs should be.

Table 2 shows UCR's calculated weights, the comparable Delaware weights, and the average of the two ("Hybrid UCR Weights") which represent the committee's recommendation. The Delaware study produced weights for a wide variety of academic disciplines. To obtain the Delaware weights for a particular UCR college, the discipline-specific weights from the Delaware study were applied to the various courses taught by that college, and the results were then aggregated to the college level, to produce a single weight for the college. In this way, the Delaware weights were aggregated to the UCR college level in proportion to the courses in each discipline within the college.

Table 2. UCR, Delaware, and Hybrid UCR Weights Relative To CHASS For 5-Year Period 2014-15 – 2018-19

College	UCR Weights Relative to CHASS	Delaware Weights Relative to CHASS	Hybrid UCR Weights (Committee Recommendation)
BCOE	1.9	1.3	1.6
CHASS	1.0	1.0	1.0
CNAS	1.8	1.2	1.5
GSOE	1.7	1.3	1.5
Business	0.8	1.0	0.9
SPP	0.8	1.0	0.9

Applying a Credit Hour Weight Model

The current budget model allocates tuition money to the colleges separately for several different metrics (e.g., undergraduate workload FTE, undergraduate major headcount, master's headcount). The only piece of the budget model under consideration by this committee was the undergraduate workload FTE piece. The status quo for that piece is to use a weight of one for each college's undergraduate workload FTE when allocating the applicable money. For example, if two colleges each had 1000 undergraduate workload FTE in a given year, those two colleges would get precisely the same amount of money from that piece of the budget model, even if their costs were different. The hybrid weights recommended above tip the scales so that the FTE in one college counts differently than the FTE in

another. For example, if CHASS had a weight of 1.0 and CNAS had a weight of 1.5, CNAS would get 1.5 times as much money as CHASS for applicable undergraduate workload FTE.

The undergraduate workload FTE piece of the budget model allocates a considerable amount of money each year—$61.6M in 2018-19 alone. If the committee trusted that the new hybrid weights were a perfect measure of what colleges should be spending, and the committee was not worried about problems resulting from sudden funding changes, then it would be reasonable to apply those weights to the entire amount. However, it is almost certainly true that the hybrid weights are imperfect, and moreover, even if they were perfect, applying them to the entire amount would suddenly shift millions of dollars from some colleges to others. To avoid these issues, the committee recommends applying the weights only to the growth in undergraduate workload FTE above the 2019-20 year (i.e., the current budget year). This compromise simultaneously funds colleges in a way that is closer to their real costs, while avoiding a problematically large redistribution of money in a short timeframe. Importantly, it also reduces financial barriers to growth in more expensive colleges that were effectively losing money with each additional student under the status quo method.

Retrospective Analysis

Table 3 shows the results of a retrospective analysis of what *would have happened* in 2018-19 if the committee's recommendation had been adopted for that year. For this calculation, 2016-17 is used as the baseline and thus *two* years of FTE growth are considered. (Note that the committee recommends that 2019-20 be used as the baseline for the actual deployment of the Hybrid UCR Model.) The baseline portion of the FTE is funded with the status quo weights of one for all colleges and the Hybrid UCR Weights are applied only to the *difference* in the undergraduate workload FTE between the baseline year of 2016-17 and 2018-19.

The last column of Table 3 shows that the difference between using the status quo model and the proposed Hybrid UCR model is not problematically dramatic. Furthermore, the table does not consider the many millions of dollars allocated from sources other than undergraduate workload FTE, as these sources were not under consideration by the committee. After accounting for those sources, the percentage impact of the proposed method is even smaller than what is implied by this table. The proposed method can thus be thought of as a nudge rather than a leap in the direction of a more accurate funding model.

Table 3. A Retrospective Analysis of 2018-19 Undergraduate Workload FTE Funding Under Actual and Proposed Methods using 2016-17 as the baseline.

College	2016-17 Undergrad Workload FTE	2018-19 Undergrad Workload FTE	FTE Growth Between 2016-17 and 2018-19 to Which Hybrid UCR Weights Would Apply	Total Actual 2018-19 Distribution for Undergrad Workload FTE	Total Proposed 2018-19 Distribution Accounting For UCR Hybrid Weights	Difference Between Actual and Proposed
BCOE	1608.7	1819.6	210.9	$6,100,438	$6,251,509	$151,071
CHASS	8797.5	9180.7	383.2	$30,779,760	$30,465,758	-$314,002
CNAS	5023.5	5575.0	551.5	$18,691,035	$18,929,873	$238,838
GSOE	161.9	335.2	173.3	$1,123,814	$1,204,115	$80,301
Bus.	1309.3	1389.0	79.7	$4,656,929	$4,571,046	-$85,883
SPP	9.6	74.9	65.3	$251,227	$180,902	-$70,325
Total	16910.6	18374.4	1463.8	$61,603,203	$61,603,203	$0

References

Hemelt, Steven W., et al. Why is Math Cheaper than English? Understanding Cost Differences in Higher Education. No. w25314. National Bureau of Economic Research, 2018.