Penn's campus has been a laboratory of the experiments of architects working to express the value of an institution that has itself been transformed while remaining true to its founder's ideals.

—George Thomas, Lecturer in Urban Studies, and David Brownlee, Shapiro-Weitzenhoffer Professor of the History of Art, *Building America's First University* (University of Pennsylvania Press, 2000)

Chapter 8: Finance and Administration

Introduction

An outstanding undergraduate education requires outstanding services, resources, and facilities to support it. Over the past decade, Penn has worked hard to enhance coordination and integration across schools and programs as the most effective means of improving undergraduate academic experiences. This work has included expanding opportunities for dual degrees, inter-school minors, and other cross-school and cross-disciplinary programs; advancing innovative technologies for teaching and learning; enhancing state-of-the-art student support services; and sustaining the critical housing and other infrastructure that supports student learning both in and out of the classroom.

Penn's leadership in open learning and its commitment to active learning methods have invigorated efforts to enhance teaching and learning across campus, as indicated by the recent award from the Association of American Universities to develop new methods of teaching introductory science and math courses. Our efforts to provide the support necessary for student success have shown significant improvement. As measured by survey results, student satisfaction with advising and other services has increased dramatically in the past ten years.

One way to gauge the effectiveness of the administration of undergraduate education at Penn is to explore to what extent the University and its schools have achieved their goals. Although Penn's last decennial MSCHE review focused on graduate education, there have been a number of planning exercises within and across schools that address the undergraduate experience. Most of these initiatives involved the Council of Undergraduate Deans, which engages in a continuous strategic review of undergraduate education. The overall goal of providing an excellent education for undergraduates can be distilled into specific goals. This chapter addresses Penn's progress on specific goals related to undergraduate education articulated in the recent past and reviews important recent developments in the finance and administration of undergraduate education.

Working Group Charge and Process

The charge to the Finance and Administration Working Group was to evaluate the financial and administrative structures of undergraduate education at Penn, especially to assess the budgetary and financial structures that organize undergraduate education and to consider potential changes. The

Working Group was asked to address undergraduate education in the context of MSCHE Standards 2 and 7. Some of the group's work has been incorporated into Chapter 2: Access and Equity and Chapter 4: Global Engagement. It met regularly during the 2012-2013 academic year, examining the University's budget documents, reviewing reports and other information about recent developments in the financial and administrative structures of the University, and meeting with key administrators responsible for financial aid, budgeting, and undergraduate education.

Questions considered by the Finance and Administration Working Group included:

- What are some specific challenges or problems related to the financial and administrative structures of undergraduate education at Penn?

- What are some alternative models for financial and administrative structures?

- What specific changes, if any, should be made to the current financial and administrative structures that organize undergraduate education at Penn?

- What are some qualitative judgments, strategic thoughts, and recommendations about the financial and administrative structures that organize undergraduate education at Penn?

Assessing Undergraduate Education through Earlier Strategic Planning

This section describes the structures in place at Penn for the administration of undergraduate education in the context of seven specific goals. It includes a number of initiatives (access, local and global engagement, integration of knowledge, and undergraduate research) that are discussed in additional detail in the previous chapters.

Goals for Improving Undergraduate Education at Penn[1]

1. Improve the integration of undergraduate educational programs across the schools.

2. Expand cross-school and cross-disciplinary programs, focusing on differentiating strengths and developing new signature interdisciplinary programs and tracks.

3. Encourage excellence in the innovative use of technology to enhance teaching and learning.

4. Encourage, emphasize, and reward excellence in every aspect of the teaching mission.

5. Provide every undergraduate with superb academic and career advising – essential components of an excellent undergraduate education.

6. Attract and retain students of different origins and cultures.

7. Make substantial investments in the University's residential, classroom, and extracurricular facilities.

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[1] This list is from "Building on Excellence: The Next Agenda," published in *Almanac* in April 2002 (http://www.upenn.edu/almanac/FC-Agenda.html), which is representative of other reports over the past several years, including the 1994 Self-Study Report, the 21st Century Project for the Undergraduate Experience, and the white papers published periodically by the Student Committee on Undergraduate Education.

Improve the integration of undergraduate educational programs across the schools.

As noted in the Introduction to this report, each of the four undergraduate schools maintains its own curriculum and has a distinctive structure and mechanisms for oversight. To provide coordination among the undergraduate schools and various University-wide offices, the Office of the Associate Provost for Education was established in 2006 to oversee graduate and undergraduate education. This position was later reconfigured as the Vice Provost for Education, who convenes and chairs the Council of Undergraduate Deans and has responsibility for the College House system, the Benjamin Franklin and University Scholars programs, the Center for Undergraduate Research and Fellowships, and other offices related to undergraduate education.

In this context of the independence of the four undergraduate schools, the University and the schools have moved to coordinate or integrate aspects of students' academic experience. Many of these efforts are detailed in Chapter 5. Two new programs that resulted directly from the leadership of the Vice Provost for Education are [the expansion of the Penn Reading Project into a campus-wide theme year](#) and [the new inter-school courses of the Cross Currents initiative](#).

There is good coordination among schools for the provision of foundational and sometimes specialized courses that take advantage of faculty expertise in other schools. For instance, most basic science for Engineering students is taught in the College, basic calculus and other mathematics instruction occurs in the College for Wharton and Engineering students, and many College students learn statistics from that department in Wharton. The Annenberg School for Communication oversees the Communication major in the College, and the Fine Arts and Architecture majors in the College are overseen by the School of Design.

Expand cross-school and cross-disciplinary programs, focusing on differentiating strengths and developing of new signature interdisciplinary programs and tracks.

The dual degree is a distinctive element of undergraduate education at Penn, allowing a student to follow the full degree programs of two undergraduate schools and graduate with a degree from each of them. There are several highly selective coordinated dual degree programs to which prospective students may apply, which provide specialized advising and co-curricular opportunities. Three of these programs are more than ten years old: the [Huntsman Program in International Studies and Business](#) (between the College and Wharton), the [Jerome Fisher Program in Management and Technology](#) (between Wharton and Engineering), and the [Nursing and Health Care Management Program](#) (between Wharton and Nursing). Since then, the [Vagelos Life Sciences and Management Program](#) (between the College and Wharton) and the [Vagelos Integrated Program in Energy Research](#) (between the College and Engineering) have also been established.

There is a robust collection of inter-school minors, which the College has developed in collaboration with other schools, including Actuarial Mathematics, American Public Policy, Biological Basis of Behavior and Health Services Management, Consumer Psychology, Legal Studies and History, Sustainability and Environmental Management, and Urban Real Estate Development (all with Wharton), Urban Education and Urban Studies (with Education), Cognitive Science (with Engineering), Nutrition (with Nursing), and Landscape Studies (with Design). A new minor in Bioethics (with the Perelman School of Medicine) was

recently approved by the School of Arts and Sciences and will admit students beginning in the fall of 2013. For a discussion of inter-school minors, see Chapter 5.

In 2012, the College and Penn Engineering developed a structure to allow students in each school to pursue a second major in the other school rather than a dual degree, so that the student would not have to fulfill all the general education requirements of the second school. As of December 2012, more than 100 students have taken advantage of this opportunity. For a discussion of second majors across schools, see Chapter 5.

Besides adding majors and minors, the schools have revised their General Education curricula based on their assessments of student learning and the alignment of the curricula with the schools' and the University's educational goals. A new version of the Nursing School's curriculum that "bridges the gap between class and clinical" took effect in 2011. Wharton's innovative Management 100 course provides a common first-year experience for its students and provides a foundation for the study and practice of business. A new version of the College's General Education curriculum went into effect in 2006. It explicitly emphasizes integration of knowledge in two of its sectors, as well as cultural awareness within and beyond the United States. In 2011, the College launched its Integrated Studies Program, a year-long residential program for about 80 first-year students that comprises team-taught double-credit courses each semester, designed to introduce students to the power of ideas and the integration of disciplines.

Encourage excellence in the innovative use of technology to enhance teaching and learning.

Most of the University's classrooms (except those in the Wharton School) are part of a central pool, overseen by the University Registrar. There are approximately 200 classrooms in the central pool, ranging in size from small seminar rooms to 400-seat lecture halls. The Provost's Classroom Committee and the Classroom Technology Services Group facilitate upkeep of the classrooms, as well as major renovations and technological enhancements, although each school is responsible for maintaining and upgrading its teaching laboratories and specialized classrooms. The University provides $2 million per year for these purposes (increased from $1 million in 2005), and over the years every central pool classroom (as well as others under school control) has been renovated to include computing, networking, projection, upgraded lighting and seating, and other enhancements. The Classroom Technology Services Group works with schools' information technology offices to facilitate pedagogical experiments such as the use of lecture capture, audience response systems (clickers), and, most recently, active classroom environments. Wharton's information technology office has provided similar enhancements to the School's classrooms.

Beyond the classroom, there have been numerous efforts to support faculty and student use of technology in teaching and learning. The Penn Libraries provide classroom management software, recently transitioning from Blackboard to Canvas. The Libraries and the School of Arts and Sciences created the Weigle Information Commons, which provides a technology-rich study space for students in the main library, as well as a laboratory for technological experimentation (the Vitale Digital Media Lab) in which faculty and students can try new software and hardware and receive tech support from experts. The Library recently added a "branch" of the Information Commons on the east end of campus, called the Education Commons at Franklin Field.

Penn has experimented for many years with the online delivery of courses. The College of Liberal and Professional Studies (LPS) within the School of Arts and Sciences has developed an online platform (the LPS Learning Commons) for the development and delivery of online material in what are now viewed as "traditional" online courses. Recently, the University has been a leader in the massive open online course (MOOC) movement through its participation in Coursera, and participating departments are adapting materials developed for the Coursera platform to enhance teaching and learning in Penn classrooms.

A great deal of technological innovation in undergraduate education has been localized in schools and departments. Science and technology laboratories in the College, Engineering, and Nursing have been transformed to use computing, communication, and specialized tools that support innovative active-learning approaches in STEM and health-related fields. Students in classes across all four schools perform and analyze sophisticated simulations of financial, scientific and medical phenomena, while students in arts and humanities classes take advantage of digital humanities projects to study and analyze primary source material from Penn's library and museum collections, as well as those offsite.

The recently announced implementation of Canvas as the University-wide learning management system (LMS) is an example of collaboration across the schools. Up to now, different schools at Penn have used different systems, including Blackboard or school-developed systems. A single LMS will allow faculty and students across Penn to use one integrated set of tools to manage all their courses. The Graduate School of Education, the Law School, and the Wharton School have already made the transition to Canvas. Canvas will be available to instructors for courses offered in the fall of 2013 and spring of 2014 and, by the summer of 2014, will be fully implemented across the University.

Encourage, emphasize, and reward excellence in every aspect of the teaching mission.

Penn takes pride in the high level of involvement of its standing faculty in teaching undergraduates at every level. For many years, there has been a robust program of Freshman Seminars, organized by the College, that includes faculty from across the University, including from some of the professional schools. Faculty members take seriously their dual responsibilities to oversee and deliver curricula within their majors and to support the general education of all Penn students.

The Center for Teaching and Learning (CTL) was created in the College in 1999 to advance innovations in pedagogy and support faculty members who want to improve their teaching. Since its creation, its role expanded to include mentoring new faculty, training teaching assistants, facilitating classroom observations, and providing online resources for instructors. In the mid-2000s, CTL began providing its services and support to Penn's other schools. In 2008, when it moved its operations to the Office of the Provost, its resources and services were fully expanded to other schools. Most recently, CTL has begun providing pedagogical support for faculty teaching open online courses.

Penn has long used end-of-semester course evaluations. Before 2009, schools and departments used different paper-based forms, and there was no systematic way to archive the results. In 2009, course evaluations were standardized and moved to an online system. This move has increased student participation, provided more detailed and thoughtful feedback, and allowed for increased flexibility and customization. For example, in academic year 2012-2013, the College's Committee on Undergraduate

Education recommended changes in the evaluation to focus more on learning goals and outcomes, particularly for courses satisfying its General Education sector requirements.

Provide every undergraduate with superb academic and career advising – essential components of an excellent undergraduate education.

The past ten years have seen dramatic improvement in student satisfaction with academic and career advising, as well as other support services. Academic advising of undergraduates is school-based, and each undergraduate school has its own style of advising. For example, Wharton relies primarily on professional advising staff in its Undergraduate Division. Academic advising in Engineering is carried out largely by faculty members, while its Advising Office primarily handles special situations and students in difficulty. Nursing and the College follow a blended approach, in which faculty and professional advising staff share academic advising responsibilities. In the College, each incoming student is assigned a pre-major advisor who helps the student navigate the General Education part of the College curriculum and aids in the exploration and selection of a major. Pre-major advisors are often members of the faculty. Senior administrators, College House Deans, and professional advisors in the College Office also provide pre-major advising. Once the student declares a major, an advisor from the major department is assigned. All four schools have some form of peer advising, which matches first- and second-year students with more senior students.

The University and the schools have developed a suite of technological tools to aid with academic advising, most notably the Penn In Touch system and its mirror Advisor In Touch system. Penn InTouch provides curriculum worksheets that students use to plan their course schedules and school offices use to audit progress-to-degree, record advisor notes, and post Course Problem Notices. Course Problem Notices are used by instructors to inform students when their coursework is deficient, and that notification is shared with the student's advisors. An example of a school-developed tool now being used University-wide is XCAT (External Credit Advising Tool), which was developed by the College for students to submit electronically the materials required by departmental faculty to determine transfer credit, credit away (when an enrolled Penn student takes a course at another institution during the summer), and study abroad credit. These tools have greatly enhanced the ability of advisors and students to organize the information needed to make decisions about their academic plans.

Student life advising and some other forms of academic support are centralized through the Office of Student Intervention Services and other offices in the Division of the Vice Provost for University Life, Penn Athletics, and other departments. Over the past several years, centralized advising has become much better coordinated, both internally and in relation to school-based advising. In particular, case conferences about students with academic or other difficulties can now be initiated by any participant, so that different units, under the guidance of Student Intervention Services, can coordinate more effectively to provide a comprehensive approach to student problems.

Career advising is provided primarily by Career Services, which oversees On-Campus Recruiting, provides career counseling and advice, and offers a wide range of web-based information to undergraduates planning for life after graduation. Career Services works with the schools to produce career-related

events for students exploring majors with an eye toward potential careers (for example, a College Alumni Mentoring Series).

The results of student survey questions on advising have been quite encouraging. According to the 2012 Senior Survey, 65 percent of students reported being generally or greatly satisfied with academic advising before declaring a major, 73 percent of students reported being generally or very satisfied with advising in their first major and 78 percent for their second major. Eighty-one percent of students reported being generally or greatly satisfied with Career Services, 79 percent with Counseling and Psychological Services, 77 percent with Student Health Services, 75 percent with student housing, 71 percent with the administration's responsiveness to student concerns, and 88 percent with availability of academic support and assistance. These figures show a robust pattern of quite considerable improvement over the corresponding results from the Senior Surveys of 2002 and 2007, as shown in Figure 8.1.

Figure 8.1
Satisfaction with Advising: Percentage of Students Responding Generally or Greatly Satisfied
Senior Surveys, 2002, 2007, 2012

	2002	2007	2012
Academic advising before declaring major	45	58	65
Advising in first major	60	65	73
Advising in second major			78
Career Services	67	80	81
Counseling and Psychological Services	74	75	79
Student Health	55	66	77
Student Housing	62	73	75
Administration responsiveness	61	75	71
Availability of academic support	77	87	88

Note: In the 2002 and 2007 surveys, there was a single question on "Quality of advising in your major" rather than separate questions for first and second majors. For each aspect of advising, the number reported is the percentage of students responding generally or greatly satisfied.

Attract and retain students of different origins and cultures.

See Chapter 2: Access and Equity for details about Penn's efforts in this regard.

Make substantial investments in the University's residential, classroom, and extracurricular facilities.

We noted above the University's investment in classroom facilities through the Provost's Classroom Committee and Central Technology Services, particularly the increased commitment of $2 million per year for classroom renovation and upgrades.

There are currently eleven [College Houses](#), which house about two-thirds of Penn undergraduates, including nearly all first-year students. Academic activities in the houses are organized by the Office of College Houses and Academic Services. Each house has a Faculty Master and two Faculty Fellows (usually members of the standing faculty, but some senior administrators serve in this capacity) who, along with the House Dean (who is a staff member), oversee activities in their respective houses. These activities include community-building, promotion of undergraduate research, tutoring in basic courses, and residential programs organized around intellectual or academic themes. Several houses cooperate with schools to host academic programs: for example, first-year students in the Huntsman Program in International Studies and Business live together in Kings Court/English House; most first-year Management and Technology Students live in Ware College House; and first-year College students who are Benjamin Franklin Scholars pursue the Integrated Studies Program and live together in Riepe College House. There are credit-bearing, language-specific communities in Gregory College House, and the College House Music Program provides lessons for credit to qualified students through the Music Department.

The College Houses have seen major improvements over the past decade. Each of the three high-rise buildings (Harnwell, Harrison, and Rodin) has undergone major renovation, as have Du Bois College House and the Quadrangle (primarily first-year housing comprising Fisher-Hassenfeld, Riepe, and Ware College Houses, including the McClelland dining facility). The Class of 1920 Dining Commons has been re-imagined and renovated to include retail eateries along with a traditional dining hall. In the coming years, the University anticipates the construction of a new College House on Hill Field and renovations to Gregory and Hill College Houses.

Each of the four undergraduate schools has constructed new academic buildings or substantially renovated old (in some cases, historic) ones. Wharton completed Huntsman Hall in 2002 and is expanding Steinberg/Dietrich Hall. Nursing completed a major renovation of Claire Fagin Hall in several phases between 2004 and 2011. Engineering constructed Levine and Skirkanich Halls and the Singh Center for Nanotechnology. The School of Arts and Sciences constructed the Lynch Laboratories; made substantial renovations to Fisher-Bennett Hall, the Music Building, the Solomon Laboratory, Claudia Cohen Hall, and College Hall; designed and built new undergraduate biology "superlabs" and undergraduate chemistry laboratories; and is just starting construction of a Neural and Behavioral Sciences building that will bring together the Biology and Psychology departments with the Biological Basis of Behavior Program.

In addition to the construction of the Weigle Information Commons and the Education Commons at Franklin Field, during this decade the University completed the Platt Student Performing Arts House, began renovations of the ARCH building (which houses three of Penn's cultural centers and CURF), opened the Weingarten Learning Resources Center, and provided new quarters for Student Health Services and Counseling and Psychological Services.

The University's athletic and recreational facilities have also been transformed over the last decade. The most auspicious addition has been the 24-acre Penn Park at the east end of campus, which combines spaces for organized athletic and recreational activities with places for relaxation and informal play. Athletic venues in Penn Park include sprint turf fields, a softball stadium, a tennis center, and an enclosed seasonal air structure. Penn has also constructed the Pottruck Fitness Center, the Weiss Pavilion, and the Fox Fitness Center at Franklin Field and begun the renovation of Hutchinson Gymnasium.

A commitment to climate action has guided Penn's facilities planning. In 2007, President Gutmann was the first Ivy League president to sign the American College and University Presidents' Climate Commitment. This pledge committed Penn to developing plans for significant reduction of its emissions of climate-altering greenhouse gases. Penn's Climate Action Plan lays out the plans to achieve these goals, as well as the means to track and communicate progress to the Penn community and external audiences. For example, using the proceeds from the recent sale of 100-year bonds, the University has made a commitment to replace HVAC systems and lighting with more energy-efficient technology, improving facilities and reducing energy consumption. An important component of the Plan is also academic, with a wide range of courses and programs about sustainability.

Further Assessment of Undergraduate Education

The Working Group examined a number of ongoing administrative projects and initiatives, including plans for a new student records system, the role of Responsibility Center Management in administering undergraduate education, a review of recent developments in undergraduate tuition, and a description of recent innovations in teaching and learning.

Next Generation Student Systems

The web-based advising services and applications discussed above have been very effective at providing information to students, instructors, and academic advisors. However, the underlying information structures are 20 to 30 years old. In 2008, the Offices of Student Registration and Financial Services and of Information Systems and Computing began planning for the next generation of student services and systems. Known as NGSS (Next Generation Student Systems), the project focuses on three core areas: student records and registration, financial aid, and billing and receivables. Representatives from schools, academic centers, and departments, along with undergraduate and graduate student organizations, are involved in the planning process. In 2011, the NGSS team completed a roadmap for replacing the core system. In 2012, it issued a request for proposals to the two leading student systems producers, Oracle (producer of the Campus Solutions package) and Ellucian (producer of the Banner system). Earlier this year, the team recommended implementing Ellucian's Banner at Penn.

Responsibility Center Management

Penn has been a pioneer in the use of Responsibility Center Management (RCM), which provides the managerial framework for budgeting and financial reporting at the University (and in some cases in the schools). While RCM was initially implemented at Penn to control expenses during a challenging financial

period in the early 1970s, it has since proven to be a strong driver of innovation and excellence. Indeed, the stated purposes of RCM are to promote broad and careful stewardship of Penn's financial resources, enhance the University's capacity to generate revenue, and encourage and reward innovation and efficiency. The schools and other responsibility centers benefit from entrepreneurial activity, and the University aligns incentives to promote stewardship and revenue generation while maintaining and reinforcing core academic values.

Within RCM, the University is divided into "responsibility centers" of two basic types: schools, resource centers and business services are *revenue-generating* centers; and libraries and certain administrative service centers are *non-revenue generating* centers. The revenue-generating centers are expected to fund the direct costs of their operations, balance their internal budgets, and cover their share of the non-revenue generating centers via Allocated Costs.

In general, RCM promotes disciplined financial decision-making, since the schools are responsible for maintaining balanced budgets. It promotes entrepreneurial activity, since the schools retain most of the revenue they generate and can invest it in their highest priorities. It also facilitates shared programming and fundraising—for example, the Schools of Arts and Sciences and Engineering recently collaborated to construct the Singh Center for Nanotechnology. Finally, RCM promotes a culture of accountability, since tuition revenue is distributed transparently, space charges are directly tied to occupancy and costs, most administrative units are funded via transparent algorithms, and each school ultimately recognizes the full costs of its programs.

In an RCM system, it is possible that the financial interests of different centers (e.g., different schools competing for undergraduate tuition dollars), or the interests of a school in relation to the wider University, can at times become misaligned. Such cases require intervention from the central administration, in consultation with the schools, to maintain the integrity of academic programs and adherence to the University's mission. We give three examples to illustrate potential challenges:

- *Tuition distribution.* The explicit nature of tuition distribution implied by RCM could encourage unnecessary duplication of courses (more on this below).

- *Real estate resources*. Several buildings and facilities on the campus are managed by centers, which charge the schools and academic centers for their use. While this is consistent with the RCM philosophy, it could create unintended consequences.

- *Study abroad.* The schools encourage students to spend a summer or a semester abroad for legitimate academic reasons. However, when a student spends a semester abroad, Penn Abroad becomes the "teaching school" for the purposes of tuition allocation, creating the possibility that this loss of tuition revenue to the school might compete with the academic benefit of study abroad.

Tuition

The undergraduate schools at Penn are highly tuition-dependent. An analysis by Penn's Office of Budget and Management Analysis indicated that tuition has consistently covered approximately 70 percent (±2 percent) of the cost of undergraduate education over the last decade, where the cost of undergraduate education comprises instruction (about 73 percent), financial aid (about 17 percent), student services (about 5 percent), and academic support (about 5 percent). This reality puts a spotlight on the setting of tuition rates (done annually by the Trustees) and the distribution of tuition among the schools.

Penn's undergraduate tuition and fee charges increased by 3.9 percent in fiscal year 2012-13 to $43,738, the second lowest percentage increase in 44 years. For fiscal year 2013-2014, the Board of Trustees authorized a $188 million financial aid budget and the rate of tuition increase will again be 3.9 percent (total tuition and fees will be $45,890, marking the fifth consecutive year the increase has been under 4 percent). Peer institutions have reported tuition and fee increases ranging from 3.1 percent to 4.9 percent. Historically, Penn's increases have closely matched the average for its peer group, been generally lower than the average for all private institutions, and been significantly below those of public institutions in recent years (Figure 8.2).

Figure 8.2
Trend in Tuition Increase - Penn Vs. Other Private Institutions Vs. Public Institutions
2003-2014
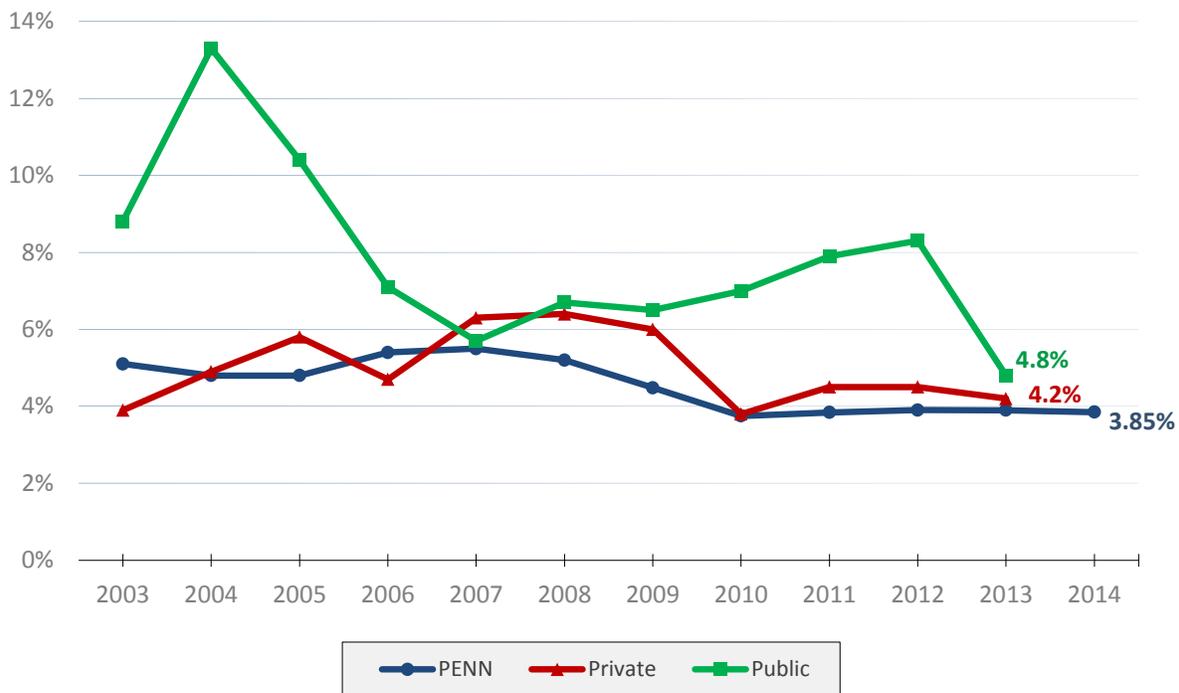
Source: Annual Survey of Colleges, the College Board

Tuition is allocated by course units (CUs) taken by undergraduate student. Twenty percent of collected tuition goes to the Provost's subvention pool (at least 74 percent of which is then distributed directly to the twelve schools, with the balance going to centrally provided services and resource centers such as the Penn Libraries, the Penn Museum, the Annenberg Center for the Performing Arts, the Institute of Contemporary Art, Penn Athletics, and other important initiatives); 20 percent goes to the "home school" of the student taking the course; and 60 percent goes to the "teaching school" (which is usually one of the four undergraduate schools but may be a graduate or professional school). A financial aid factor (35 percent in fiscal year 2012-13) is subtracted from the home school and teaching school portions of the distributed tuition to fund financial aid.

This formula has been relatively stable over many years. Until fiscal year 2012-13, a smoothing function known as the "tuition guarantee" was applied to mitigate sudden fluctuations in tuition for individual schools. An analysis demonstrated that this policy had essentially no effect and so, beginning in fiscal year 2013-14, schools will receive their "actual" tuition revenue each year.

Figure 8.3 summarizes the outcome of the distribution of tuition for the schools, showing the distribution of the portion of tuition remaining after deducting 20 percent for the Provost's subvention pool and the financial aid factor.

Figure 8.3
Undergraduate School Tuition Distribution

Tuition Distribution AY2007-2012	Home School Portion	Teaching School Portion	Total Portion
SAS	58%	64%	63%
Wharton	21%	19%	19%
SEAS	16%	8%	10%
Nursing	5%	5%	5%
All Others		4%	3%

As illustrated in the table, students in the College (of the School of Arts and Sciences, or SAS) accounted for 58 percent of all course units taken during this five-year period; however, 64 percent of all course units taken by students in all four schools were for courses in SAS. Therefore SAS received 63 percent (58 percent of the 20 percent home-school portion plus 64 percent of the 80 percent teaching school portion) of all distributed tuition.

These data reflect the fact that all undergraduate students take courses in the School of Arts and Sciences. For example, in the fall of 2011, SAS taught 86 percent of the CUs taken by College students, 40 percent of the CUs taken by Engineering students, 35 percent of the CUs taken by Wharton students, and 16 percent of the CUs taken by Nursing students.

A small but significant percentage of the teaching portion of undergraduate tuition (4 percent) is being earned by non-undergraduate teaching schools. Most of this teaching is related to the fine arts, architecture, and communication majors in SAS; almost half is by the School of Design; and a quarter is by Annenberg. Just over one percent of undergraduate teaching overall is to undergraduates taking graduate-level courses in the Graduate School of Education, Law School, Perelman School of Medicine, and School of Social Policy and Practice. Generally, this figure represents students who take graduate-level courses related to their majors. Given that some of the tuition retained by the undergraduate schools is from courses taught by special arrangement with professional school faculty, it is estimated that roughly five percent of all CUs are taught by faculty outside the four undergraduate schools.

Transparency and accountability are significant advantages of the tuition distribution system. Thus, the system encourages innovation and entrepreneurship among the undergraduate schools (for example, the new Cross Currents courses, the Management 100 course in Wharton, the Integrated Studies Program in the College, and the coordinated dual degree programs) and provides a mechanism for substantive participation by the graduate and professional schools in undergraduate education. Examples of this participation include the College major in Communication offered by the Annenberg School; the Fine Arts and Architecture majors provided by the School of Design; and teaching provided by Medical and Law faculty in the Biology; Biological Basis of Behavior; Philosophy; Philosophy, Politics and Economics; Political Science; and Urban Studies majors, as well as the Freshman Seminars.

On the other hand, the explicit nature of tuition distribution in what often appears to be an unregulated environment could encourage unnecessary duplication of courses: for example, basic economics and statistics is taught in three schools and physics in two schools. In addition, graduate and professional schools can see undergraduate tuition as a potential source of enrollment-driven revenue. While there is no evidence of systematic problems of this kind, it would be useful to consider alternative methods of tuition distribution (e.g., by student headcount or some other metric developed for this purpose, rather by CUs) that might further minimize any such potential adverse outcomes while still maintaining the clarity and the positive influences of the current system.

Innovations in Teaching and Learning

Penn has been a national leader in pioneering new methods of online learning and leveraging success in this arena to improve classroom instruction. In recent years, there have been dramatic changes in the perception of the most effective means to deliver education. In 2012, more than 2 million people registered for free college-level online courses. Worldwide enrollments for these massive open online courses (MOOCs) in 2013 will almost certainly rise considerably higher, with several hundred classes being offered on a variety of online platforms.

Partly because of the demonstrated interest in freely accessible online education across many academic fields, highly selective institutions across the nation are reconsidering the most effective means to deliver education, whether virtual or face-to-face. In consideration of the unknown impact on higher education of free college-level courses, Penn ought to develop administrative and financial plans that ensure the strongest possible positive impact of innovations in undergraduate education through the adoption of new evidence-based techniques for improved learning.

For certain areas, particularly the science, technology, engineering, and mathematics (STEM) fields, substantial evidence has shown that "active learning" practices improve learning outcomes for a diverse student population, when compared to standard teaching methods in traditional courses. Several elements of MOOCs appear to be equally useful for implementing "active learning," either online or in face-to-face classrooms, where students spend significantly less time receiving information "live" from an instructor and considerably more time in peer-to-peer learning, frequent evaluation of their comprehension of the material, and forming and engaging in learning communities.

In particular, there is a strong need for immediate planning and construction of classroom spaces appropriate in size, number, and technological capability to implement active learning strategies. Second, there is a need to create incentives for departments to shift to active learning strategies, particularly for introductory courses in STEM fields in which shortcomings in traditional teaching methods (and potential solutions) have long been identified and studied. In June 2013, the Association of American Universities awarded $500,000 to the College and Penn Engineering for their proposal to improve teaching of STEM gateway courses along these lines. Third, ongoing discussions with deans and faculty members about online learning should be increasingly directed toward focused planning activities, engaging a broad array of faculty, to formulate the expected outcomes of experimentation with Coursera, pilots in changing introductory STEM teaching, and online learning through Penn LPS. Necessary decisions about how and how much to invest in such initiatives will benefit from thoughtful faculty input and especially additional research, in order to ensure quality active learning experiences appropriate for a Penn education, whether online, in-class, or a blend of both.

Strategic Considerations

Penn's structure of four undergraduate schools, each with its own curriculum and faculty, provides a rich environment for the study of the arts and sciences and professional fields. A combination of school-based advising programs and centrally run support programs enables the creation of both small, targeted programs and large systems for supporting Penn's undergraduate students. This structure has proven a very effective means of delivering educational experiences to undergraduates. The coordination, planning, and assessment of undergraduate education, both at the level of institutional leadership and among the various offices and units who deliver instruction and programs, encourages innovation at the unit-level and mitigates the difficulties students sometimes find in navigating a complex structure. With those observations in mind, some considerations for continuing the effective finance and administration of undergraduate education at Penn include the following:

- Maintain Penn's four-school structure for organizing undergraduate education, with students admitted into specific schools.

- Increase opportunities for cross-school study (whether among or beyond the four undergraduate schools) when intellectually sound, retaining control within the undergraduate schools.

- Encourage continued collaborations among schools and University resources on advising and student support.

- Encourage free or reduced-rate use of performance/meeting space for school-sponsored student activities, recognizing that this will require the replacement of lost income for the units charged with managing these resources.

- Maintain the tuition distribution mechanism in principle. However, explore alternative methods of tuition distribution, keeping in mind the desirable properties of the current system (transparency and encouragement of innovation and collaboration).

- Encourage development of a centrally convened process to determine unnecessary duplication of course offerings.

- Provide greater transparency in financial arrangements for semester study abroad programs (in particular, provide regular reports to schools and departments about the costs of study abroad programs), so that schools can weigh financial cost against educational value.

- Encourage systemic shifts to evidence-based models for improved teaching and learning in undergraduate education, particularly in introductory courses.

Recommendations

Given the role that finance and administration play in supporting all of Penn's priorities, this chapter echoes the recommendations of earlier chapters. Bearing in mind the strategic considerations noted above, the Office of the Provost, supported by the Office of Budget and Management Analysis, will continue—through established means of regular consultation, analysis and strategic academic planning—to further advance coordination across the undergraduate schools.

Given the technological ferment now reshaping higher education, among the most critical arenas for such coordination and strategic planning will be instructional innovation. Penn should work assiduously to extend its leading role in open learning, capitalizing on its early investments to chart best practices in the deployment of new technologies in undergraduate teaching and learning, including developing new methods of active classroom learning and using open learning initiatives to stimulate new forms of instruction on campus. To this end, the Office of the Provost, the Council of Deans, and the Council of Undergraduate Deans should work with the Center for Teaching and Learning, the Penn Libraries, and the Penn Open Learning Initiative to advance structured, active, in-class learning, new technologies of online open learning, and various hybrid instructional models blending the highest quality online and in-class instruction.