

I *The student credit hour was invented as a tool for smoothing transitions from K–12 into higher education and was reinforced by foundations wanting to encourage business models—including competition and unit-cost analysis—in higher education.*

The History of the Student Credit Hour

Jessica M. Shedd

How did the metric of the student credit hour come to be? It is not an organic, naturally occurring entity but is an invented artifice, intellectually derived to serve particular purposes. An American innovation, it was designed at the end of the nineteenth century to translate high school work to college admissions officers. It slowly made its way into higher education to record elective course work when standardized curricula began to erode. And it became widespread as the result of pressure from the philanthropic community interested in using business models to document workload and institutional productivity.

To document the evolution of the credit hour, we pieced together a picture derived from many sources. It included a standard review of the literature, a look at the history of The Carnegie Foundation for the Advancement of Teaching (central to the creation and expansion of the credit unit), the North Central Commission on Learning (the first regional accrediting commission to use the credit hour), the Association of American Colleges and Universities (currently researching the credit unit in relation to academic transfer), and several doctoral theses and unpublished papers.

Raubinger, Rowe, Piper, and West (1969) described the history of the credit unit as divided into three phases:

1873–1908: Increasing dissatisfaction with the college admissions process and high school-to-college articulation

1908–1910: The proposal and implementation of a standard high school unit

1910 to the present: The introduction of the Carnegie unit, its widespread growth, and its effect on both secondary and higher education

Gerhard (1955) breaks down the development of the credit system into two phases:

1870s and 1880s: With the rise of the elective system, colleges began to measure teaching in course and hour units.

Around the turn of the century: High schools and colleges assigned credit units to their courses and defined graduation requirements in terms of credits.

Additional stages and influences have guided the evolution of the credit hour into the broad-based measure that it is today. From its beginning as an academic measure of student learning for a rapidly growing student population, it has evolved into a measure of efficiency and faculty time and become a metric for internal budgeting and external data reporting. In general, three strands have coalesced to form the development of the credit hour: first, the need to handle enrollment growth and diversity while maintaining a handle on academic standards; second, desires from within higher education for curriculum reform and flexibility; and third, pressure from external stakeholders to force performance and accountability measures onto the educational establishment.

Phase I: College Admissions and a Standard High School Curriculum

From 1890 to 1900, the percentage of fourteen- to seventeen-year-olds going to high school almost doubled, and public high school enrollment continued to grow at an amazing rate into the early decades of the twentieth century (Lagemann, 1983). By 1910, more than 15 percent of fourteen- to seventeen-year-olds were enrolled in high school, a percentage that jumped to 32 percent by 1920. This was a period of enormous expansion for high schools, encouraging much discussion about the mission of the high school and its curriculum. This expansion made college possible for a greater number of students but also revealed a need for a standard measure of academic work completed in high school. National standards for high school programs and college entrance requirements became necessary not only to help high schools adequately prepare their students for college-level work but also to help colleges evaluate the increasingly large pool of applicants from a wide range of high school programs.

In the 1890s, the National Education Association appointed the Committee of Ten on Secondary School Studies, chaired by Charles Eliot from Harvard, and the Committee on College Requirements to address these issues (Levine, 1978). These groups prepared the reports that laid the

groundwork for standardizing high school curricula across the country by designating programs with certain “unit” distributions as prerequisites to college acceptance. “Every subject which is taught at all in a secondary school should be taught in the same way and to the same extent to every pupil. Thus, for all pupils who study Latin, or history, or algebra, for example, the allotment of time and the method of instruction should be the same” (National Education Association, 1894, p. 17). The standard curriculum was to be provided to all students “regardless of their educational aspirations and that all subjects be held of equal rank for admission to college” (Levine, 1978, p. 159). Courses were to be calibrated in course units, which were based on contact-hour measures. Thus, learning was measured through time in class spent on the standard curriculum. The new system of measuring courses in units was designed to increase transferability of students and credits throughout the United States (Kreplin, 1971). The units were adopted by the newly formed College Entrance Examination Board of the Middle States and Maryland and by the North Central Association.

Development of the Carnegie Unit. Although The Carnegie Foundation for the Advancement of Teaching did not develop the idea of the unit, the foundation was instrumental in the widespread acceptance of the measure. In 1906, when the Carnegie Foundation was established, Andrew Carnegie gave \$10 million to provide retirement pensions for college teachers. Concise definitions of college, university, professor, public versus private, and denominational versus independent institutions were needed, however, before a pension plan could be introduced. To “scientifically” define these terms, both the Carnegie Foundation and the General Education Board conducted extensive institutional surveys to formulate specific, empirical definitions for each term (Barrow, 1990). Drawing on the surveys and the State of New York’s Regents Board standards for accreditation (Rudolph, 1977), the foundation proposed that a college be eligible for retirement allowances “if it (1) had at least six professors giving their entire time to college and university work, (2) had a course of four full years in liberal arts and sciences, and (3) required for admission not less than the usual 4 years of academic or high school preparation, in addition to the pre-academic or grammar school studies” (Raubinger, Rowe, Piper, and West, 1969, p. 81).

In addition, a college must accept the unit plan for admission, with a unit being defined as any one of four courses carried for five days a week during the secondary school year. Under ordinary circumstances, it assumed that a satisfactory year’s work in any major subject cannot be accomplished in less than 120 sixty-minute hours or their equivalent. The “Carnegie unit,” as it became known, was finally defined and accepted in 1909. The foundation explicitly stated that “in the counting the fundamental criterion was the amount of time spent on a subject, not the results attained” (Kreplin, 1971, p. 2).

The foundation also announced that if a college did not meet the requirements of the Carnegie Foundation's definition, it would not receive retirement allowances for its professors. Because few colleges at the time had their own pensions or annuity funds, the unit was quickly accepted in both colleges and high schools. By 1910 almost all high schools measured course work by the Carnegie unit (Raubinger, Rowe, Piper, and West, 1969).

Standardization and Measuring Efficiency. About the same time that the Carnegie unit was developed, the Carnegie Foundation and the General Education Board also supported the growing view that a fundamental problem with American higher education was that colleges were operating as separate units, leaving many institutions as “unguided and inefficient” providers of education (Barrow, 1990, p. 82). As a result, these organizations began to promote the idea of a single, standardized, and comprehensive system. The “scientific” definitions of *college* and *university* developed for the pension system provided a starting point by offering standard terms and definitions (Barrow, 1990).

In 1910, Morris L. Cooke published “Academic and Industrial Efficiency,” a report that was underwritten by the Carnegie Foundation. The thinking of the time was that detailed “accounting and time-use” information that could be compared across time and between institutions was essential. The purpose of Cooke's report was to develop a formula to estimate the cost and output of both teaching and research—essentially “to measure the efficiency and productivity of educational institutions in a manner similar to that of industrial factories” (Barrow, 1990, p. 67). The goal of the work was to find a way to measure productivity in higher education to allow higher education to be subjected to competitive market pressures akin to those in private industry. To accomplish this, Cooke developed a “calculus” with a key unit of measure called the *student hour*, defined as “one hour of lectures, of lab work, or recitation room work, for a single pupil” (Barrow, 1990, p. 70). This measure made possible the calculation of relative faculty workloads, the cost of instruction per student hour, and ultimately, the rate of educational efficiency for individual professors, fields, departments, and universities. As a result of Cooke's report, the Carnegie Foundation published “Standard Forms for Financial Reports,” which required standard administrative and accounting forms and procedures for all colleges applying for the Carnegie Foundation pension system.

Throughout the next decade, public higher education was redefined as a “social investment” in the economy. Public institutions, forced to justify their “rate of return” to the public, began to survey themselves to obtain data such as cost per student hour. Efficiency surveys thus became increasingly popular, and Cooke's “student hour” was adopted as the basic measure of production. By the end of the 1920s, institutional data recording and retrieval systems had been restructured to accommodate nationally standardized measurements of productivity and rates of return on investment (Barrow, 1990).

The Elective System. In his 1869 inaugural speech as president of Harvard University, Charles W. Eliot (who also chaired the board of trustees

at the Carnegie Foundation) made public his commitment to the elective system. Eliot saw electives as a motivator for students and a way for them to study the subjects in which they were naturally talented or interested. By 1872, all subject requirements for seniors at Harvard were abolished, and by 1885, requirements even for freshmen were reduced. The change from a standard curriculum to the elective system fundamentally altered the content of the college degree from something awarded based on the mastery of a comprehensive curriculum to the successful completion of a series of courses. With this curricular change, however, colleges needed a way to keep track of courses and students' progress along the various paths toward their degrees. Determining how course work should be measured and progress to the degree monitored constituted the major challenge in implementing the elective system.

The first units of measure were the courses themselves, which were defined in hours of classroom contact. By 1877, the University of Michigan catalogue indicated that twenty-four or twenty-six full courses were required for the bachelor's degree and that a full course equals "5 exercises a week during a semester, whether in recitations, laboratory work, or lectures" (Gerhard, 1955, p. 654). The measure of achievement was based on a common time unit, and the accumulation of the set courses and time units constituted a complete bachelor's-level education.

The larger state universities in the Midwest and West were the most eager to adopt the elective system, whereas the least receptive schools were the smaller, private New England colleges. By the 1890s, however, the universities of Wisconsin and Michigan were among the few major institutions that still maintained required freshman and sophomore courses. Over time, the expanded choices that the elective system provided led to the creation of majors and minors, academic departments, and specialization of scholarship (Lucas, 1994).

The growth of the elective system was related to the spread of mass secondary education. Public opinion called for a wider variety of college courses more appropriate to the diverse interests of high school graduates. Demand to make institutions more attractive to the broader public led to a huge increase in course titles and a corresponding need for some way to document students' progress. With a greater number entering higher education, student mobility also increased and quantitative, transferable learning units became critically important.

Phase II: Administrative, Budgetary, and Regulatory Enforcement

Once the basic credit-hour measure had developed, its use as an administrative, reporting, and external monitoring device began to evolve. The companion background articles in this project go into greater detail about all of these elements. In brief, the following are some of the major themes affecting this evolution.

Federal Financial Aid and Regulation of Higher Education. The federal role in higher education expanded enormously as a result of the enactment of the GI Bill. Research on the GI Bill has shown that concern about quality and “diploma mills” led the federal government to require that institutions be accredited to be eligible for GI tuition reimbursement. For many years, the federal government deferred to the accrediting agencies to make judgments about academic quality. This deference was eroded considerably with the growth of Title IV student aid programs in the 1980s and 1990s and the perception of problems of fraud and abuse in these programs. As a result, the federal government intensified its oversight of accrediting agencies through a federal “recognition” process—the federal regulation of accrediting agencies seeking to be “gatekeepers” for Title IV funds. Accrediting agency standards and procedures that previously were internal to the agencies began to leach into federal law as standards for federal review and recognition of accrediting agencies. At the same time, the federal government began to import standards such as the credit hour into its own requirements for institutional eligibility for Title IV and for record keeping. In addition to requiring the institutions to measure learning either through credits or “clock hours,” the government required institutions to maintain standard academic calendars built on credit or clock hours. These measures became standardized and enforced through the regulation of institutional eligibility to receive Title IV funding.

Data Reporting. Federal government research has reinforced the use of the credit-hour measure in higher education. The credit-hour measure has been embedded in federal data systems since the 1960s. Integrated Postsecondary Education Data Surveys is one such system that relies on the measure. Federal systems are in turn the basis for most public information about higher education, such as the Common Data System used by the rankings agencies. All states have also standardized their data collection formats to conform to federal information requirements.

State Budgeting Systems. The credit hour came into widespread use as the basis for formula budgets for public institutions of higher education somewhere in the 1960s, probably as a result of the expansion of public, multicampus systems that occurred during this time. This was also the era of “PPBS”—program-planning budgeting systems—throughout state government. In several states, formula budgets based on enrollment-generated credit hours became the building block for the distribution of public funds. As one example, the history of the University of California system shows that what was then called “performance-based” budgeting based on the credit hour was one of the early reforms instituted under Clark Kerr’s leadership as president of the Berkeley campus, when the “system” moved from a Berkeley-flagship model to the “multiversity” (Douglass, 2000).

Collective Bargaining. The rise of faculty collective bargaining in public higher education has likely been another force for cementing the use of

the credit hour as a measure of faculty classroom contact. (For more on this subject, please refer to the companion background chapter [Chapter Four] by Thomas Ehrlich on collective bargaining and faculty workload.)

Phase III: Present and Future: The “Deinstitutionalization” of Higher Education

Students today are increasingly obtaining access to higher education through lifelong learning, multiple student transfers, and off-campus or distance learning. Students are increasingly disloyal to individual institutions and accumulate courses toward a degree from several institutions. According to a study conducted by Adelman (1999), over 60 percent of undergraduates attend more than one institution, and 40 percent transfer across state lines. Student mobility has taken on a new meaning because of educational technology and distance learning, which has allowed courses to be made portable through the World Wide Web. Some institutions of higher education, such as Charter Oak State College (described in more detail in Chapter Three), award degrees based on assessments of student course portfolios from multiple institutions. In this model, the institutional role has changed into one of assessment of course work rather than direct provider of instruction or guardian of the curriculum.

Frustrations with the inadequacies of the credit-hour measure—its inattention to student learning and its time-and-location-based method for recording learning—are particularly evident in the areas of transfer and distance education. This is true despite the fact that the credit hour is the vehicle that allows student learning to be recorded and transferred across many types of institutions. Distance education, in particular, is exerting pressure on the traditional measures of learning—because it forces a review of institutional policy on issues such as contact-hour requirements, budgeting structures, and infrastructure (Twigg, 1999). Even the federal government, in an attempt to respond to pressures from “virtual institutions,” has adapted slightly in granting waivers to some of the Title IV fund eligibility regulations. For example, the “50-percent rule,” which requires a minimum of 50 percent of an institution’s courses to be taught on campus, has been waived to accommodate many distance education-based institutions (for more on this subject, please refer to Chapter Six by Jane Wellman on federal regulations).

Conclusions

Although the student credit hour’s origins are rooted in events that occurred over a century ago, the themes surrounding its creation and use have not fundamentally changed. In fact, this exploration of the evolution of the credit hour has a *déjà vu* quality to it. Virtually all of the major issues that shaped the evolution of the measure are alive today: the explosion of

enrollments, the desire to ensure that all students learn to a common standard, the need to correlate high school graduation requirements with college admission standards, pressures for public accountability, desires for greater institutional efficiency and productivity, student transfer and mobility, and attention to the quality and integrity of the collegiate curriculum. Developed in an industrial era well before the massification of higher education, the measure itself has remained essentially unchanged. Whether that is attributable to its adaptability or a sign of the basic calcification of higher education remains an open question.

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JESSICA M. SHEDD is a research analyst in the Office of Institutional Research and Planning at the University of Maryland, College Park.