

Function, importance and future of academic credits in higher education

Abstract

One of the key educational policies that the Mexican federal government has long been promoting within higher education institutions is the transformation of their traditional, long-standing curricula which govern, yet also stagnate and perpetuate, their academic and even political life into flexible, innovative, motivating, and dynamic curricula. To achieve this, such a transformation must be accompanied by the implementation of an appropriate and relevant system for assigning and transferring academic credits. Primarily, this system should allow for the objective, numerical assessment of the time and various activities both dependent and independent that students undertake within classrooms, clinics, and laboratories, as well as the work performed outside these settings that contributes to their education, learning, and professional development. Furthermore, the use of a credit system will streamline inter-institutional student mobility processes by reducing the administrative burden associated with credit equivalencies, validations, and recognitions, thereby fostering conditions conducive to the internationalization of higher education programs.

Keywords: flexible curricula, academic credits

Volume 17 Issue 4 - 2026

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Received: September 8, 2026 | **Published:** October 12, 2026

Introduction

Higher education provided by educational institutions designed for that purpose at a given historical-educational moment required a form or method to assign an objective and concrete value to the theoretical and practical activities that the academic programs considered to be carried out by the students and that also served as a point of reference when they were compared or carried out student mobility activities with other educational institutions and programs that are the same, similar or related.

But what are academic credits, what is their function, and what is their importance in higher education? We will begin by defining them from the perspective of the authors of this work. An academic credit is the unit that measures the training time of a student in higher education, based on the professional and academic competencies that the program is expected to develop. The usefulness of credits lies in having an objective and concrete parameter for comparison between different national and international training programs and in providing an idea of their quality in relation to the dependent or independent theoretical-practical hours that a student completes during the curricularly programmed time to finish the entire course, its content, and the general and specific activities considered.¹ To understand them a little better, it is always important to know part of their origin.

Background of academic credits

The importance of knowing its origins

References to the origin and use of the concept of academic credit date back to the late 19th and early 20th centuries, when it began to be formally discussed in the United States. The term was not coined by a single person, but rather originated from a corporate and institutional initiative. The primary entity responsible for its creation, standardization, and application was the Carnegie Foundation, founded and directed by Andrew Carnegie. This foundation emerged to promote the advancement of education, and it began using the term publicly and openly in 1906, initially under the name Carnegie Unit.

This objective and concrete unit of measurement was established as a result of American universities, in the late 19th century, designing, promoting, and offering courses that students or their parents could choose to pursue and complete a bachelor's degree. This degree, in turn, certified that the student had acquired the necessary knowledge in a specific area to practice a profession.

In that country and time, universities offered elective courses as something novel and innovative, instead of applying a curriculum with predetermined, unchangeable, and fixed subjects. This strategic offering, employed as an educational strategy to attract a greater number of interested students, initially generated great disorder. Compared to what was already established, ordered, and systematized, it was very difficult to measure, evaluate, and determine internally and externally how much a student had studied and learned, and to determine whether or not they were suitable to practice their chosen profession. To address this, the foundation measured studies based on exposure time or "seat time." At that time, it was defined that one unit or credit was equivalent to one subject taken during a full academic year, which was equivalent to 120 hours of school and academic instruction.²

Oddly enough, the Carnegie Unit wasn't established for educational or training purposes. Instead, Andrew Carnegie was able to create an executive and operational administrative structure to determine whether a teacher had completed the required years of service to retire and receive a pension from the retirement fund he had created for that purpose. Alongside this reason, the foundation also needed a tool to define, conceptually, operationally, and demonstrably, that the institute offered higher education, structured and justified under the university model. Gradually, the Carnegie Unit was reconceptualized and reused to measure the quality, time, and manner in which academic programs were taught, and based on certain parameters, to qualify as a candidate to receive financial support from government contributions. As a consequence of this intention and motive, it began to be required that students aspiring to enter the university had to have previously completed a minimum of 14 Carnegie Units in High School (secondary/high school) so that they could have the guarantee that they entered the higher academic program with a certain level of

knowledge and skills, thus guaranteeing in advance the success and quality of training they would receive.

Another figure who contributed to the evolution of the concept of academic credits was industrial engineer Morris Llewellyn Cooke, who in 1910 published a report on the creation of a new variant for the use of the Carnegie Unit. In this document, he reevaluated the concept and further circumscribed it to the university environment, technically naming it the “Student Hour.” He proposed and concluded that the way to value it would be that one hour of class per week would be equivalent to one academic credit, totaling 120 hours of class per year. He established that one credit was equivalent to an exact number of hours of direct contact between the student and the teacher in the classroom (originally 120 hours of class per year). This procedure began with the unification of admission criteria to North American universities, which gradually began to be applied by other universities worldwide.

One of the first universities to begin using this metric to assess and quantify the subjects taught, as well as the quality of its educational processes considering the quantity and times of instruction was Harvard University. As a result, this university was also one of the first worldwide to begin offering higher education through flexible curricula, allowing students to choose elective subjects and accumulate a greater numerical value in academic credits for them.³

Current academic credit times

Its application in Mexico

After a long time, in 1972 Mexico developed what is known as the Tepic Agreement, which described a specific methodology for credit allocation. This agreement was promoted by the National Association of Universities and Institutions of Higher Education (ANUIES). The agreement consisted of establishing a standardized system of academic credits to measure the workload of students and facilitate student mobility between academic programs at different higher education institutions. It established a basic mathematical formula to calculate the value of each subject in whole numbers based on theoretical classes and seminars, valuing one hour of class per week during a semester as equivalent to 2 credits, and practical classes or workshops as equivalent to one hour of practice per week, which would be equivalent to 1 credit. All of this was intended to standardize curricula among different schools in the country to allow for equivalencies, validations, revalidations, and the transfer of students from one institution to another.

This agreement also established that a semester should have a minimum of 15 effective weeks of classes, set a total value for undergraduate study plans of a minimum of 300 credits and a maximum of 450, and for high school it established a value of 180 to 300 credits for upper secondary education.

Following this, in 1989 the concept evolved completely in Europe, giving rise to what is known as the European Credit Transfer and Accumulation System (ECTS), registered as the Bologna Process. With this evolutionary transformation, the credit ceased to simply measure the static hours the student spent in classrooms and began to calculate their total workload, including hours of study at home, assignments, and exams. Subsequently, Latin America began to adopt it with the same objective, but adapting it to its own interests and existing academic credit systems.⁴

Given these precedents, other countries interested in the same goal developed, proposed, and promoted agreements regarding the use

of their own academic credits or implemented proposals from other countries. Currently, more and more countries have done the same or are in the process of doing so. What is evident is that the current global trend permeating the field of education, and particularly higher education, is to value internally and/or externally its curriculum, study plan, content, duration, quality, versatility, innovation, flexibility, and academic, professional, and social recognition through the granting or obtaining of academic credits.

Currently, the most widespread and accepted proposal for managing and assigning credits in Mexico is called the “System for Assigning and Transferring Academic Credits,” or better known as SATCA. This system was approved by ANUIES in October 2007 and is a technical-operational model implemented to standardize, recognize, and transfer student credits as an assessment tool to measure and determine how much progress they have made in their training, how much they still need to complete their training, using it as an indicator to carry out the processes of validation, equivalence, and revalidation between the institution of origin and the receiving institution in student mobility processes (SATCA will be discussed specifically later).

Function, importance and future of academic credits

Academic credits in curricula, and particularly in study plans, have always been a subject of analysis, discussion, reflection, and consensus, even negotiation, in academic meetings for curriculum restructuring. These meetings address collegiate, school, administrative, and academic standards, institutional provisions, administrative, school, and academic problems that arise within classrooms, clinics, and laboratories, disciplinary and professional agreements and sanctions, and even the political power and control of academic groups. These factors represent employment and salary opportunities and have strained, delayed, or blocked these meetings, even preventing credit definitions.

Although curricular re-engineering has been ongoing for some time in many higher education institutions, there is still a long way to go in terms of making their curricular designs more flexible. All educational institutions that have been or are currently undergoing these processes of educational re-evaluation and transformation agree on the urgent need to prioritize, value, and measure knowledge production, equitable, efficient, and high-quality social inclusion, regional integration, student mobility, and progress toward comprehensive and sustainable development, among other things, during educational and professional training. However, the number of educational institutions or cases where this has been achieved is very small. Therefore, new perspectives are urgently needed regarding the application of awareness-raising and work strategies to advance in this area and truly transform disciplinary and professional training, impacting teaching, research, outreach, community engagement, and management.

Finding answers to the questions: How can university curricula address the rapid pace of scientific and technological change and the evolving social reality? What institutional mechanisms are necessary to avoid curricular rigidity that leads to the unnecessary lengthening of degree programs, their obsolescence, and their disconnection from national and regional issues? How can we promote national and international student mobility while respecting the idiosyncrasies and regulations of the region, country, and each educational institution? How can we incorporate dialogue with non-academic knowledge into education? How can we rethink disciplinary training, research, and professional development? How can we reconcile the university's

social responsibility? How can we integrate the voices of graduates into curricula? The coincidences in the agreements and the definitions to achieve it have led to thinking and believing that the most viable alternative at the moment to objectively achieve what was stated with that question is the curricular conversion towards flexibility based, assessed and valued with the assignment of academic credits to the contents, to the dependent and independent activities and to the final products obtained by the students during their course through the academic program.⁵

The search for these answers implies that academic programs and their curricula must, before working with academic credits, define and justify each of their structural components based on a broad and comprehensive analysis of the national and international educational context. This analysis should address the needs, priorities, urgent issues, and trends within the academic, professional, economic, political, and social context, taking into account the program's modality and duration. Under this premise, it is important to consider and bear in mind that a traditional curricular approach in these times, based on study plans overloaded with content and with course accreditation almost exclusively through in-person, written assessments at the end of the semester or academic year, is now considered inappropriate, rigid, outdated, and demotivating. Furthermore, it is inefficient and ill-suited to respond to the new times and modalities of higher education and employment. Therefore, a flexible, horizontal rather than vertical, open, rational, and less pretentious approach to objectives, goals, and strategies is required. This requires the planning of educational activities that redefine the core and components of the curriculum, reducing the amount of content as much as possible, focusing on the student's learning capacity and recognizing the variety that each student possesses to learn in a different way, taking as a behavioral axis the internationalization of the academic program, student mobility, the creation of inter-institutional networks, and the opportunity for the student to be responsible for choosing the subjects necessary to build their school and academic trajectory, among other dimensions.

The conscious or unconscious institutional folly of wanting to produce homogeneous and specialized students and professionals has led educational programs to mistakenly believe that forging students in a sea of knowledge only an inch deep is correct. This belief results in curricula with juxtaposed content, fragmented knowledge, and a compartmentalized view of professional reality. As an alternative, it is thought that the function and importance of academic credits as an academic assessment of student learning and activities lies in allowing higher education institutions to take into greater account the academic workload that students choose and construct based on their interests and reasoning, using real criteria such as interest, motivation, life plan, and available time for in-person and distance learning activities, including both dependent and independent work. While a student's primary task is indeed to learn, and even though this activity should occupy the majority of their time during their years of study, it is unthinkable that it should be the only activity they undertake.

The consideration of learning activities within reasonable timeframes determined by academic credits fundamentally changes the traditional conception of professional education and the time dedicated exclusively to study. In this sense, the credit system operates based on the recognition of the actual time available to the student for their educational process and respects the time dedicated to other dimensions of human development. Furthermore, it revalues the student's independent work, enabling them to plan and responsibly manage their own learning process. Recognizing the time available to the student for their learning process at a given educational level

allows for more reasonable curricular design of academic programs and the subjects that comprise their study plan. This design combines factors such as relevance, quality, and the student's ability to choose their professional interests and broaden their cultural horizons with the real and available conditions and resources for achieving the educational ideals proposed in the curriculum and oriented towards the human and professional quality of its graduates.⁶

The adoption of a credit system in the curriculum is not a starting point, but rather a destination. For the educational institution, credits represent the culmination of a process of curricular transformation, a redefinition of educational policies, and a cultural shift within the academic communities themselves. Adopting a credit system requires building a new educational culture that affects not only the curriculum, but also the organization and administration of the academic community, the provision of services, the achievement of interdisciplinary connections among different fields of knowledge, and the adoption of more decentralized and autonomous planning methods. In administrative and financial terms, the credit system entails designing plans to modernize and update enrollment, registration, and academic records systems, and includes building an academic information system that enables and promotes student mobility and transferability. Similarly, and perhaps one of the most impactful and difficult aspects of a comprehensive credit system involves resizing educational activity, changing the relationships between teachers, students, and the social environment, shifting the school and academic culture towards developing "learning to learn" processes, and raising awareness and training the academic community to address these new processes.⁷

The future of academic credits

Its importance in curricular flexibility

Despite the time that has passed since the first conceptual proposal regarding academic credits emerged as the Carnegie Unit in the late 19th and early 20th centuries, its use and importance continues to be a topic and reason for analysis and discussion within the groups of higher education institutions that are working on changing their traditional curriculum towards a flexible one, discussions that will possibly last a long time.

Despite understanding the advantage of using academic credit and recognizing its importance in terms of the benefits it brings to the educational process and its necessity for the execution and operationalization of a flexible curriculum and national and international student academic mobility, it is clear that a university academic program needs an objective and concrete regulatory framework for the official recognition of studies already completed by the student at other peer/receiving educational institutions. The transfer of credits, along with the analysis of the similarity of the content and learning objectives of the issuing institution, will more easily establish revalidation or equivalence and recognize them. Furthermore, this system can reduce operating costs, since available human resources can be shared interinstitutionally and the educational offering can be increased based on the available options.⁸

Despite recurring discussions on the matter, it is believed that in the near future, the credit system will ultimately prevail in the implementation of flexible curricula. Specifically, it is thought that the SATCA system will be the one adopted, systematically promoting mobility by enabling students to attend classes, courses, workshops, professional internships, learning placements, residencies, and other activities in alternative locations, either in person or virtually. It is

important to clarify that the SATCA credit system is not the only measure for determining and evaluating the quality, relevance, or effectiveness of an academic program. Other, more significant and important elements exist within the educational process itself, but for the moment, although acknowledged, they fall outside the scope of this work.

Before or alongside the use of credits, strategies must be considered to bring about the necessary shift in mindset within the school community for their acceptance, understanding, and application. It is recognized that this is a difficult and demanding task: considering how to combine required and elective courses, when and how to do so, when and how to reject credits granted by other institutions or disciplines, when to question external university degrees, how to consider more generic degrees that accredit and certify job skills more appropriate for the existing labor market, and how to validate, accept, and legitimize distance learning. These are situations that will have answers in the near future. While disputes regarding the use of academic credits continue in some higher education institutions, other leading educational institutions are already seeking answers to the questions raised above. The federal requirement to move towards a flexible curriculum in higher education with respect to the application of academic credits is a clearly defined educational policy and process, well-founded and irreversible.⁹

Academic credit assignment and transfer system (SATCA)

The SATCA System was designed by a multidisciplinary and inter-institutional technical group created specifically for this purpose in Mexico and disseminated by the National Association of Universities and Institutions of Higher Education (ANUIES). At the initiative and invitation of the Rector of the University of Yucatán, to structure an academic proposal for the allocation and transfer of credits. With the aim of updating the old credit schemes in place since the 1970s, known as the Tepic Agreements, this new proposal was structured taking as a reference one of the most important credit allocation systems globally, the European Credit Transfer and Accumulation System (ECTS), as it is the most widely accepted standard worldwide. This resulted in a new and innovative proposal, at least for higher education institutions in Mexico. Although they are different, it is feasible that Mexican universities can create mathematical correspondence tables between SATCA credits and the European Higher Education Area (EHEA) so that exchanges with Europe are valid. At certain points during its planning and design, references were also taken from those applied in the United States and Canada, and once the methodological proposal was completed, it was presented, endorsed, and officially approved by the General Assembly of ANUIES in October 2007. In Mexico, its acceptance has been gradual, and although it was proposed by ANUIES and has the conceptual acceptance of academics, school administrators in many universities have had reservations in some educational institutions due to the high operating costs and the regulatory complexity of modifying their internal regulations.¹⁰

The purpose of SATCA was to promote and facilitate mobility by allowing students to change schools or participate in exchange programs at other higher education institutions without losing credit for their courses, thereby increasing curricular flexibility. Its implementation helped modernize curricula and focus learning on students by assigning a unified numerical value to courses, their content, and activities outside the classroom, clinic, or laboratory, whether dependent or independent. Prior to SATCA, validations, equivalencies, and revalidations involved long and complicated bureaucratic administrative processes when revalidating subjects

from one institution to another; with the application of this system, that procedure was greatly facilitated and shortened.

The system assigns a standard value to the hours of theory, practice, and independent work by the student. The main mathematical difference lies in how study time is measured. For example, in the Tepic Credits system, only the hours of class time taught by the instructor were taken into account, whereas the SATCA system calculates both the time spent with the instructor and the hours the student dedicates to studying and working independently. Below is a comparative example of the differences between the two:

Tepic credits were calculated according to the type of subject (theory or practice) for each weekly hour in a semester of 15 to 16 weeks:

- a) Theoretical subjects: 1 weekly class hour = 2 credits.
- b) Practical subjects: 1 weekly class hour = 1 credit.

Example: A subject with 4 hours of theory per week was equivalent to 8 credits, regardless of whether the student did homework at home; those hours were worthless for credit allocation.

SATCA Credits use a fixed equivalency based on the student's total workload; below is a comparative table between the Tepic Credits proposal and that of SATCA:

Student activities per semester:

- a) 16 hours of theoretical class:

Credit value (Tepic): 2 credits

SATCA credit value: 0.32 credits

- b) 16 hours of practical work per semester:

Credit value (Tepic): 1 credit

SATCA credit value: 0.32 credits

- c) 16 hours of homework or studying at home:

Credit value (Tepic): 0 credits (not counted)

SATCA credit value: 0.32 credits

Note the real impact on the student's workload by observing how the value of the same hour changes depending on the system. Under the Tepic Credits system, a student could complete a semester with courses totaling 50 credits and spend the entire day in the classroom. With the SATCA system, to achieve those same 50 credits, 2,500 hours of total work per semester would be required (approximately 150 hours per week), which is humanly impossible. Therefore, a bachelor's degree or program measured in SATCA typically requires between 260 and 300 total credits, while the Tepic system required more than 400 (for greater clarity and understanding of the methodological process applied with SATCA, consult the document "System of Assignment and Transfer of Academic Credits").²

Conclusion

Considering and utilizing academic credits as both a means and an instrument to provide flexibility to the curriculum, and specifically to the study plan, thereby partially transforming the educational process, is no easy task. Reality involves the interplay of several factors in direct and sometimes indirect relationships. What is undeniably true is that a credit system, when applied correctly and with administrative, academic, and political will, facilitates flexibility, mobility, innovation, inter-institutional collaboration, teacher professionalization, and

savings in economic, human, and infrastructure resources—all of which benefit the educational institution. Furthermore, it empowers students to be directly involved in their education by allowing them to participate in structuring their own study plan through the configuration of required and elective courses.

Specifically, it is impossible to consider, much less claim, that a curriculum is flexible without applying the function and practical role of credits as a facilitating and mediating instrument between the educational institution, the curriculum, the content, the student, and other peer institutions. As previously stated, academic credit represents the numerical, objective, and concrete value that can be assigned to a subject in the field of education, encompassing virtually all dependent or independent learning activities undertaken by the student, in relation to the educational objectives established within the institutional curriculum that must be met. This implies that the numerical concentration of progress in professional studies can be measured by the number of credits accumulated, and not rigidly by the number of courses taken in days/hours.

In conclusion, the implementation of an academic credit system will allow professional education to gain flexibility and characteristics in several dimensions:

- A. Within a bachelor's degree program, its application will facilitate flexibility in terms of time, since it is not tied to a rigid curriculum. Students will be able to manage their time more effectively.
- B. Flexibility in the content and educational activities, as students will be able to combine general required courses with more professionally focused electives according to their planned academic path and professional interests.
- C. Flexibility regarding graduation, which could occur earlier than expected by taking elective courses ahead of schedule and thus accumulating more credits.
- D. Diversification of educational options, from diplomas and specializations to master's and doctoral degrees, offered by the educational institution itself or another with which it has an agreement, with the possibility of taking some seminars or courses at the home institution and others at the host institution.
- E. Ease of transferring from one postgraduate program to another, especially when they belong to the same field of knowledge.
- F. Among the institutions, it will allow for smoother student mobility without so much bureaucratic processing for the transfer of students, along with the establishment of simpler and more functional rules for the revalidation, recognition and validation of studies.

In short, it is urgent that higher education in Mexico, as soon as possible, transition towards curricular flexibility and the real executive and operational application of academic credits to give students more educational and training options and better opportunities and greater national and international job competitiveness, because if this does not happen, graduates of educational institutions will possibly continue to swell the ranks of the underemployed or unemployed; that is simply the function and importance of academic credits.

Acknowledgments

None

Conflicts of interest

The authors declare that there are no conflicts of interest.

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