

Scalable Credit Systems and Their Impact on Reducing Higher Education Costs: An Economic and Policy Evaluation

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Abstract: The model which uses an advanced educational system must be maintained because its rising educational costs create additional difficulties to operate. The paper will demonstrate how scalable credit systems including credit transfer frameworks and modular credentials and online learning platforms will help students to manage their higher education expenses. The paper uses economic theory and policy discussions to show how these systems create flexible educational pathways which students can move between different programs with efficient study methods. Students can use scalable credit systems to gather credits which they can share between educational institutions thus eliminating duplicate coursework and decreasing their degree completion time. The digital platforms which universities use through MOOCs enable them to reach a wider audience while decreasing their operating costs thus they make their educational programs more scalable. The advancements will produce both direct and indirect cost reductions which include lower tuition expenses and decreased need for educational facilities and lower opportunity costs which students incur. The effectiveness of these systems depends on three fundamental factors which include policy backing and effective quality control systems and college acceptance of the systems. Credit recognition problems which occur together with academic standard fear and digital divide issues create barriers which limit their potential usage. The paper establishes that international collaboration with coordinated policy regimes will help countries maximize their benefits from scalable credit systems. The results show that scalable credit systems do not solve the rising education expenses problem but they represent a significant progress toward creating higher education systems which are more flexible and accessible and maintain financial sustainability.

Keywords: Scalable credit systems; Higher education costs; Credit transfer; MOOCs; Education policy.

INTRODUCTION

The growing price of higher education is a global issue, impacting students, governments and institutions worldwide. Growing demand for higher education, growing institutional obligations and limited productivity improvements have led to significant increases in education spending over the last few decades [OECD, 2020]. This has led to increased student affordability issues, such as increasing tuition fees and student loan debt, which impact on access, equity and economic mobility [Springer, M. L., & Schuver, M. T. 2015]. To address these issues, higher education systems are in transition, with new technologies and policies at play. For example, the rise of scalable credit systems, such as credit transfer systems, online and MOOC credits, and modular and stackable credential pathways is emerging. These are designed to improve flexibility, access and efficiency of higher education. In fact, online platforms and credit-bearing MOOCs have been shown to offer cost-effective alternatives to degrees, by minimising infrastructure costs and allowing learners to participate in large groups [Levin, R. C. 2024].

Scalable credit systems also facilitate the idea of "learning anytime and anywhere" to meet the demands of today's learners for flexibility and affordability. These systems can potentially

accelerate time to degree completion and the cost of higher education, as students can earn and transfer credits between institutions and platforms. Also, international efforts have demonstrated that scalable approaches can reach marginalised groups, especially in developing areas with limited higher education capacity [Impey, C. 2020]. Despite these advances, the role of scalable credit systems in enhancing affordability of higher education is still a focus of academic and policy research. This review paper seeks to assess the economic and policy impacts of scalable credit systems, in terms of their potential to improve affordability without compromising higher education quality and equity.

Conceptual Framework

The current educational system for higher education has introduced credit systems which universities can expand to implement flexible learning methods that students can study through remote access while they spend less money on their education. The evolution of higher education systems established fixed degree paths which mandated students to complete specific study durations through official credit systems to obtain their degrees. Educational institutions established new credit systems to create credit transfer systems which enabled students to obtain academic credits

through their academic activities. The solutions create a system which enables learners to study at their own pace through affordable learning methods which exist outside of school.

Credit transfer and accumulation serve as the foundation for scalable credit systems because they permit students to receive credit from various educational institutions which count toward their official qualification. Educational institutions define their credit system according to international standards, which establish two educational credit systems: modular credit systems and competency-based education systems. The system allows students to establish their personal learning routes, which reduces their need to study existing content for educational institutions. The research demonstrates that educational organizations which apply online learning technologies can establish systems that enable students to transfer credits between different educational institutions while offering multiple learning pathways, which optimizes their resource distribution [Larionova, V. *et al.*, 2018].

The development of stackable credentials allows students to obtain educational qualifications through incremental steps, which include both certificates and micro-credentials. The system enables students to obtain degrees through credit accumulation, which permits them to take breaks from their studies according to their needs. The investment strategy enables people to improve

their skills while they face financial restrictions, which matches the human capital theory. The research demonstrates that these educational systems provide superior benefits to students who do not follow traditional educational paths and to working professionals who need low-cost access to learning resources [Stone, J. 2016].

The scalability feature is facilitated by online and digital education technologies. It might including MOOCs, that allow providers to offer courses to a large audience at low marginal cost. These systems benefit from economies of scale as they eliminate infrastructure costs and allow the sharing of resources. Research shows that online and blended learning approaches can lead to substantial gains in access, without sacrificing learning outcomes, reinforcing the economic case for scalable education systems [Gleason, K. T. *et al.*, 2021].

Policy-wise, another aspect of scalable credit systems is related to democratization and equity. Through reduced financial and geographical constraints, they can reduce inequalities in higher education [Hollands, F., & Tirthali, D. 2014]. But their success relies on the establishment of credit recognition and quality assurance policies and practices between institutions and across regions. Available studies underline that scalability offers significant benefits, but requires policy and institutional co-ordination to be effectively achieved [Modise, M. E. P. 2022] (Figure 1).

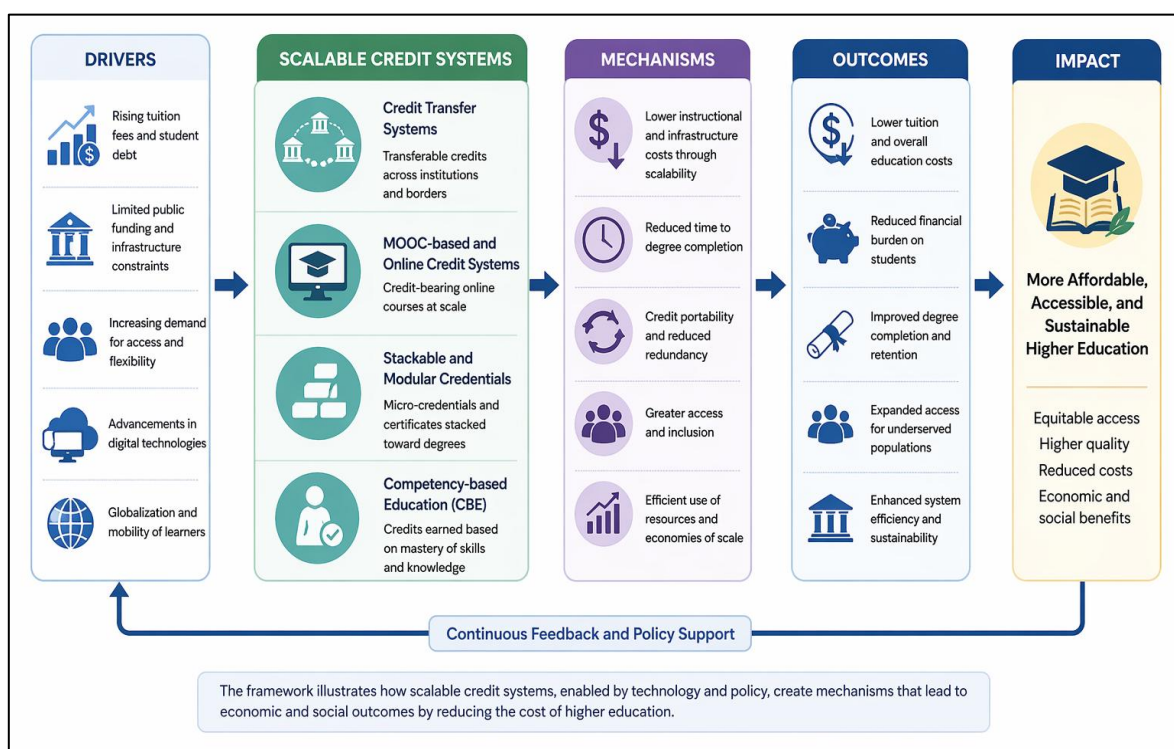


Figure 1: Conceptual framework of scalable credit systems and their impact on higher education costs.

Types of Scalable Credit Systems

Scalable credit systems for higher education include various models to increase flexibility, access and cost effectiveness through the earning, transferring, and accumulating of credit across different learning contexts. These vary in design and delivery but share a common goal of disconnecting education from the format of the institution while preserving its quality and legitimacy [Modise, M. E. P. 2022].

A well-known variant is the credit transfer system, allowing students to transfer credits from one institution to another without duplicating learning. This system is prevalent in many countries and helps promote student mobility, avoid redundant learning, and accelerate degree completion. Credit transfer systems enable students to strategically choose their educational institutions or modes of study to reduce costs while maintaining continuous learning [Baker, R. *et al.*, 2018].

The second group includes the implementation of MOOC and online credit systems in higher education institutions. Universities may recognize MOOCs as programs that provide academic credit because they evolved from their original function. The educational system provides scalable access to high-quality programs, which enable extensive student participation at lower price points. The

research demonstrates that MOOCs improve access to education while providing students with the additional credentials [Hollands, F., & Tirthali, D. 2014]. The educational system provides stackable, modular credential programs that offer multiple pathways for students to progress in their studies. Students earn smaller credentials, such as micro-credentials and professional certificates. The model allows their financial capacity and professional growth and decreased financial uncertainties. Modular approaches enable learners to maintain their educational journey. It may offers the opportunities to resume learning without having to complete a full degree program [Littenberg-Tobias, J., & Reich, J. 2018].

Another related system is competency-based education (CBE), which emphasises the mastery of skills and knowledge, rather than the time spent learning. CBE allows students to complete their education faster and possibly at reduced costs. This approach is ideal for adult learners and those with prior experience as it credits previous learning and focuses on outcomes rather than time spent in the classroom. Research also indicates that these flexible education systems can enhance efficiency without compromising learning outcomes [Escher, G. *et al.*, 2014] (Table 1, Figure 2).

Table 1: Comparison of Traditional vs Scalable Credit Systems

Factor	Traditional System	Scalable Credit System
Structure	Fixed curriculum	Modular and flexible
Credit Mobility	Limited	High (transferable)
Delivery Mode	Primarily in-person	Blended/online
Cost Structure	High fixed costs	Reduced marginal costs
Time to Completion	Fixed duration	Variable and optimized
Accessibility	Institution-bound	Globally accessible

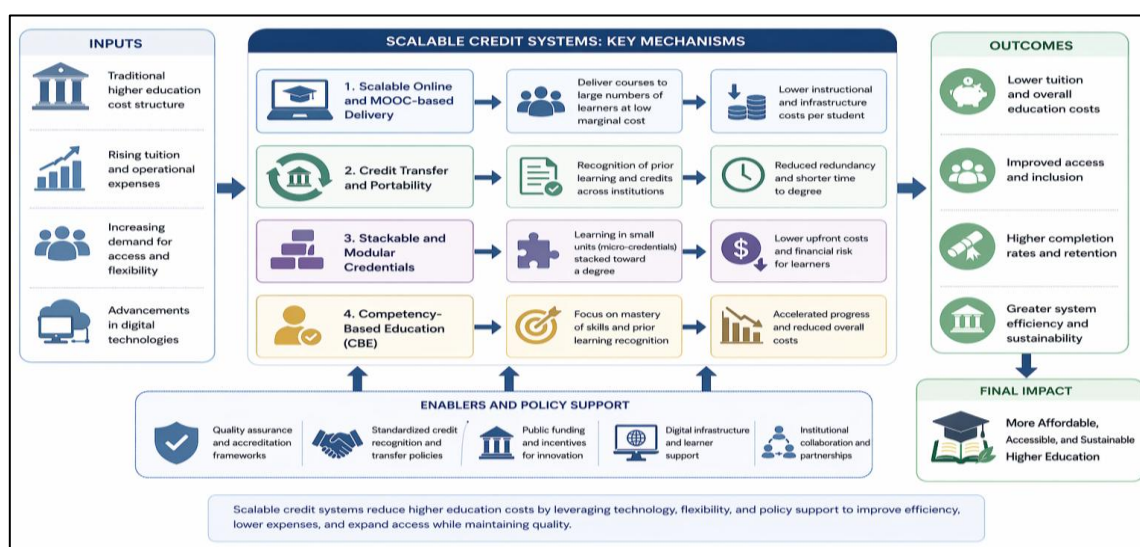


Figure 2: Mechanisms of cost reduction through scalable credit systems.

Cost Structure of Higher Education

To assess the impact of scalable credit systems in higher education, it's critical to understand the higher education cost structure. Higher education costs reflect an amalgam of institutional and student costs, both of which have risen markedly in recent years as a result of inefficiencies and increases in demand for the system.

The institution's expenses arise from its capital investments in infrastructure, including building construction and maintenance for technological systems. The operational costs of conventional college systems depend on their permanent educational facilities which include classrooms and laboratories. Facilities may entail substantial expenses for their initial construction and ongoing maintenance [Sentance, C. 2019]. The university budget establishes personnel expenses which encompasses faculty and administrator salary payments. Because university personnel have few opportunities to enhance productivity between their work and other professional fields. Universities require funding to support their research initiatives and innovation programs and student wellbeing and community outreach activities. Universities have experienced rising

operational expenses because their service delivery to students has expanded in scope which subsequently leads to increased financial demands on both governmental authorities and families [Jain, N. *et al.*, 2023]. Higher education costs for students exceed tuition expenses because students must pay additional costs for housing and transportation and educational materials and they cannot work. The additional expenses create barriers that prevent low- and middle-income students from accessing higher education. Economic and policy reforms have intensified these cost burdens, which occurred when public funding was reduced and cost-sharing programs were established. Scalable credit systems create a distinct cost structure because they require fewer infrastructure elements and enable institutions to share their resources. Online and blended learning enables instructors to teach multiple students at once, which decreases the extra expenses that come from teaching additional students. The proposed solution will decrease institutional and student expenses, its success will hinge on the upcoming policy and operational decisions that will shape its execution throughout Table 2 [Zuber, M. 2019; Cejnar, L. *et al.*, 2020].

Table 2: Cost Comparison – Traditional vs Scalable Credit Systems

Cost Component	Traditional Higher Education	Scalable Credit Systems
Infrastructure	High capital and maintenance costs	Reduced physical infrastructure needs
Instruction Delivery	Faculty-intensive, limited scalability	Scalable digital delivery
Administrative Costs	High in institutional complexity	Optimized through digital systems
Student Living Costs	High (on-campus dependency)	Lower (remote learning options)
Opportunity Cost	Fixed study timelines	Flexible, work-study balance

Impact on Cost Reduction

Scalable credit systems have the ability to decrease higher education expenses because they influence both education production and educational consumption. The systems create multiple ways to affect costs through their three functions of providing flexible systems that enable institutions to create different educational paths. Cost delivery through this delivery method represents the main method to achieve cost reductions. Virtual and MOOC-credit systems enable institutions to deliver courses to bigger student groups who can earn credit, which lowers the extra cost for each student who joins. The delivery of education through scalable credit systems needs fewer costs because these systems use existing classroom space and faculty resources to provide education to students worldwide. The system enables institutions to allocate their resources efficiently while sustaining access to educational materials

through its capability to bypass expensive facility requirements [Cejnar, L. *et al.*, 2020]. Scalable credit systems produce indirect financial advantages for students. Students who study at their own pace can complete their degrees faster, which results in time and money savings. The total fees decrease because students have to pay less and they lose more money when they miss work. The combination of work study flexibility (which includes online and modular programs) makes it easier for students who work part-time to manage their financial responsibilities while reducing their overall educational expenses [Littenberg-Tobias, J., & Reich, J. 2020]. The process operates through two main elements which work together to eliminate duplicate activities. Modular programs and credit transfer ensure that students do not have to retake the same courses if they transfer between institutions or courses. The process reduces expenses because it saves both time and money.

Research shows that effective credit recognition policies and practices can help students progress more quickly to their degrees while increasing their success in completing courses which helps colleges operate more efficiently [Larionova, V. *et al.*, 2018]. Scalable credit systems improve the complete economic efficiency of the system by allowing resources to be shared through their platform for organizational partnerships. Universities can work together to develop joint programs while sharing their course materials and accepting transfer credits from other universities which helps them use resources more efficiently. The method enables governments to achieve their goal of raising participation rates without requiring additional taxpayer funding for higher education. The system can achieve these advantages through governance systems that maintain quality standards while accepting different types of qualifications [Hollands, F., & Tirthali, D. 2014].

Policy and Economic Evaluation

The performance of scalable credit systems to decrease higher education costs depends on two factors which are the current policy environment and the current state of the economy. Technological progress provides systems with growth abilities yet the educational system needs policy regulations to determine which institutions must follow which standardization and recognition processes for implementing scalable credit systems. The development of credit portability and accreditation together with funding mechanisms which influence cost efficiency and quality standards requires input from policy makers and regulators. The initial goal of policy creation process focuses on creating educational paths which provide both affordable educational options and continuous access to educational resources. The MOOC credit system together with blended degree programs allows educational institutions to create pathways which enable underserved students to obtain higher education credentials. The educational institutions use these methods to broaden their service range without needing new funds which helps public policy aims for wider educational access and increased higher education availability to all people [Impey, C. 2020]. National qualification systems need to accept these systems as valid because institutions must use them for their credit systems to function correctly. The accreditation process represents an essential component of policy implementation. Scalable credit systems with their decentralized structure create regulatory issues because organizations and platforms face difficulties maintaining quality

standards throughout their entire network. The absence of proper regulations creates credit quality concerns which include both the quality of the credits and their eligibility for transfer between institutions. Educational institutions require detailed regulations which define credit equivalence requirements and institutional procedures for building scalable credit systems that provide economic and educational advantages according to research findings. The economic model establishes institutional performance as the basis for assessing revenue potential. Institutions believe their revenue base will decline when students pay lower tuition fees or when competing institutions enter the market which results in their reluctance to use scalable systems. Scalable systems create revenue streams through international market access and partnership agreements which necessitate policy frameworks that enable both financial sustainability and innovative product development. Research indicates that educational institutions can save money by adopting online and MOOC systems yet this financial benefit does not guarantee their decision to adopt these systems [Hollands, F., & Tirthali, D. 2014].

Equality and equity remain a key concern. While scalable systems reduce the economic barriers to participation, they can also entrench inequalities if there are disparities in access to digital infrastructure and technologies. Evidence demonstrates that while online education offers new opportunities, it can be inequitable in participation, as learners with prior educational advantages are more likely to participate, so other policies to address the digital divide and support systems for learners are needed [Littenberg-Tobias, J., & Reich, J. 2020].

Lastly, the long-term economic benefits of scalable credit systems will be achieved with system-level integration and global partnerships. Policies that promote credit transfer and sharing of educational resources can create efficiency gains and avoid redundant investments. International collaboration and standardisation can build an interconnected education system that fully capitalises on the advantages of scalability with minimal costs. However, achieving coordination requires policy commitment and harmonization across different education systems [Flynn, J. T. 2013].

CONCLUSION

Scalable credit systems present a potential solution to the challenges of increasing higher education costs, through improved flexibility, efficiency, and

alternative pathways. By offering credit transfer, modular qualifications, and online learning, they eliminate redundancy, accelerate degree completion and reduce institutional and individual costs. Although scalable credit systems cannot solve all the cost problems of education. It has a significant role in a more affordable and educational system.

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Source of support: Nil; **Conflict of interest:** Nil.

Cite this article as:

Pharkya, N. "Scalable Credit Systems and Their Impact on Reducing Higher Education Costs: An Economic and Policy Evaluation" *Sarcouncil Journal of Multidisciplinary* 6.5 (2026): pp 17-23.