

Rethinking the Structure of American Secondary Education

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Abstract

This essay examines the strengths and structural challenges of American secondary education from a comparative perspective informed by educational experience in both China and North America. While recognizing the achievements of American schools in holistic education and differentiated talent development, and the encouragement of creativity and innovation, it argues that the comprehensive high school, together with unrestricted course choice and the class-shifting system, reflects a broader transformation in secondary education—a gradual loosening of its institutional structure. As a consequence, graduation standards have been lowered, curricular structure and educational continuity have been weakened, and the guidance and sense of community essential to adolescent development have been diminished.

The paper argues that restoring appropriate academic tracking, rebuilding class communities, and establishing a more structured curriculum with stronger core requirements would help rebalance flexibility and structure while preserving the enduring strengths of American education.

1. Introduction

K–12 education has become an increasing focus of public concern in the United States. Although recent years have seen some recovery in STEM development and workforce growth, improvements in foundational student learning have remained limited; in mathematics and science, performance has often stagnated or declined, as documented by PISA and TIMSS assessments. These are the very disciplines that once anchored the nation’s technological leadership and underpinned its industrial strength. Moreover, American education exerts major global influence, making its long-term development a matter of broad international significance.

Having studied and taught in both China and North America, I have had the opportunity to observe different approaches to education and some of their long-term implications. Much of my work has focused on comparative education, involving research and collaboration with scholars across both regions. It has examined how systems, policies, curricula, and classroom practices shape learning outcomes. These cross-cultural experiences provide a vantage point from which to reflect on the ideals and realities in American K–12 education.

This essay offers a comparative perspective on the features and challenges of the structure and governance of American secondary education, and considers how certain educational foundations have been affected—and how they might be strengthened.

2. Overall Impression: A Mixed Picture

In my view, traditional Western educational ideals—such as holistic humanistic education, independent and critical thinking, and the encouragement of creativity and innovation—remain deeply valuable. In the United States, specialized schools, gifted programs, academic competitions, and other elite pathways have maintained high standards and continue to nurture outstanding talent.

My grandchildren's schooling has further reinforced these impressions. Over the past decade, they have attended Montessori, Christian, and public schools in the United States and Canada. Loving and dedicated teachers, respectful relationships between teachers and students, and children who enjoyed schooling while developing kindness and integrity all left me with lasting admiration. Notably, they never encountered discriminatory remarks toward Asian or Chinese students.

Yet the weaknesses are equally striking. As a Ph.D. teaching assistant and later a college instructor, I was often astonished by students' weak foundations. Many struggled with word problems, simple geometric proofs, or the basic principles of Newton's or Ohm's laws. When questions were raised in class, students often waited for the teacher's answer rather than thinking through the problem themselves. Examinations that would be considered moderate in China were sometimes regarded as excessively difficult.

A bright college student once told me he envied Chinese students for having parents who supported them through college. His frustration reflected a broader sense that many students were not receiving the education they deserved.

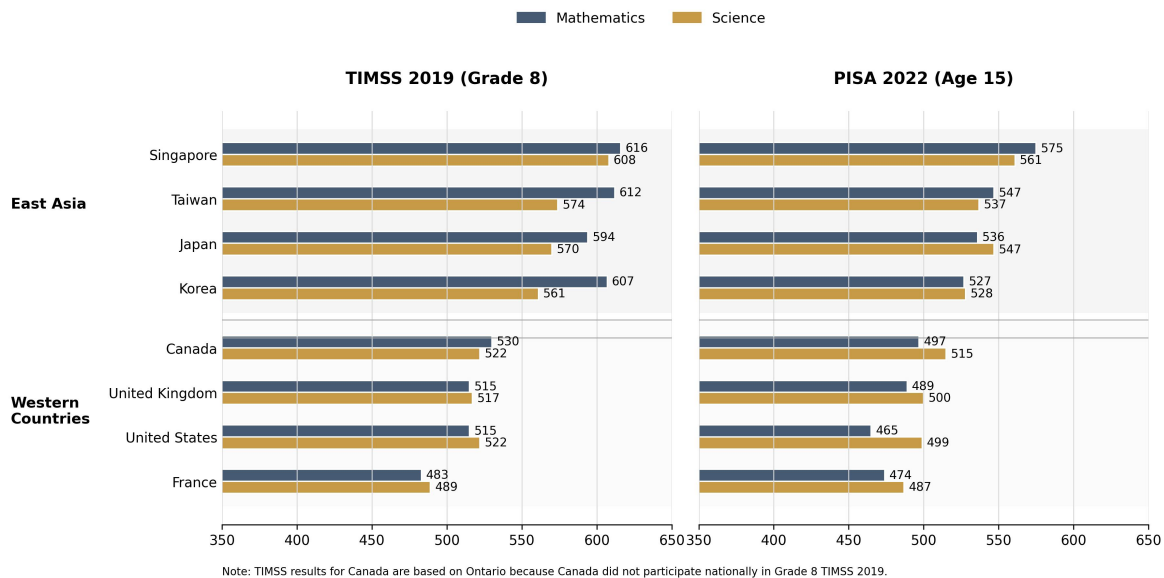
A similar pattern appeared in my grandchildren's schooling. When helping them with physics and mathematics, I frequently had to reconstruct the logic step by step, as course sequencing that lacks coherence forced students to expend excessive effort merely to grasp basic ideas, and some times they were given formulas without sufficient conceptual explanation.

These experiences are not isolated anecdotes but reflect broader trends confirmed by international assessments.

Figure 1 compares PISA and TIMSS mathematics and science scores across eight Western and East Asian systems. East Asian systems perform at a high level, while Western countries lag far behind, creating a clear East–West divide. Compared with Singapore, the United States trails by more than 100 points in mathematics and roughly 60–80 points in science.

Although test scores should not be equated with actual ability, the substantial gap between two different types of education systems nevertheless serves as a powerful warning.

Figure 1. Mathematics and Science Achievement in East Asia and Western Countries



3. Strengths of American K-12 Education

3.1 Goals and Methods of Holistic Development

If you ask Chinese immigrants in North America what they most admire about K–12 education here, their answer is often its commitment to holistic development—nurturing not only intellect but the whole person.

In my grandchildren’s schools, this ideal was vividly reflected in daily practice. Students learned through hands-on experiences: visiting farms and apiaries, gardening, and caring for small animals on campus. Project-based learning was popular. In thematic exhibitions—on topics such as food or world cultures—students gathered materials, designed displays, and presented their findings to the audience.

Extracurricular programs were equally rich: school bands and performances, sports teams and tournaments, camping, and debates, among others. Western students are especially enthusiastic about sports—skating, skiing, and a wide range of ball games.

Such activities broadened students’ horizons, strengthened communication and collaboration skills, and cultivated teamwork, leadership, and civic awareness. They became confident and independent—quite different from many of their peers in China.

By contrast, China’s primary and secondary schools today focus almost exclusively on academic achievement, especially exam results. The fierce competition for university admission

leaves little time for physical activity or practical experience. The days when boys played soccer after class or when ping-pong tables stood in every neighborhood are long gone. In my teenage years, secondary students spent two weeks each semester in rural labor—an experience now lost to history. The decline in students' physical fitness, particularly the lack of vigor among boys, has become a growing national concern.

3.2 Multiple Pathways for Talent Cultivation

Teaching according to individual aptitude and differentiated instruction have long been hallmarks of Western education. Gifted classes are designed to meet the needs of high-achieving students rather than to serve examinations or utilitarian goals; students and parents choose what suits them best and rarely complain about “fairness”—a sharp contrast with attitudes in China. Many students take upper-grade courses early, freeing time in grades 11–12 for advanced mathematics and science.

Students can also pursue advanced secondary diplomas by completing additional mathematics and science examinations. Gifted students frequently explore their interests through competitions such as the American Mathematics Competitions (AMC), the International Science and Engineering Fair (ISEF), and Olympiads in mathematics, physics, and chemistry, which foster independent thinking and genuine scientific ability.

Elite U.S. high schools—public science and math schools, a number of arts-focused institutions, and about 300 top private or IB schools—maintain rigorous standards through structured curricula and unified assessments. Ordinary schools, by contrast, vary widely in quality, so the responsibility for cultivating top science and technology talent has largely fallen to these elite institutions.

Support for students with disabilities is also strong: they are integrated into regular classrooms whenever possible and receive individualized instruction from special-education teachers, supported by generous funding.

Taken together, these systems offer students multiple pathways for growth. The principle of *teaching according to aptitude*, advocated by both Socrates and Confucius, has been realized more fully in the West than in China, where schooling remains more unified and rigid.

3.3 The University Elimination System

In China, anxiety over the university entrance examination has reached the point of obsession. Although competition for college admission in the United States and Canada is also intense, it is far less overwhelming.

A key reason lies in the elimination system in Western higher education: most universities follow the principle of easy entry but strict exit, while elite institutions maintain both strict entry and strict exit. This arrangement shifts the pressure of competition from the admission stage to the university years, encouraging students to prove themselves through sustained performance rather than a single exam.

China could draw valuable lessons from this model. The common saying that “one exam determines one’s life” reflects a system in which nearly everyone can graduate once admitted. If universities adopted a genuine elimination mechanism, the anxiety surrounding entrance examinations would ease, and students would be more likely to focus on meaningful learning rather than rote preparation or simply “muddling through” to obtain a diploma.

Such a system would also encourage greater flexibility. Students who struggle could transfer to different programs or change majors instead of being trapped by a single early decision.

4. The Loosening of Institutional Structure

Yet the same openness and pluralism that underpin many of the strengths discussed above have also produced unintended structural consequences. Three features of North American secondary education—the comprehensive high school, the excessive course choice, and the class-shifting system—appear different in form, but all reflect a common trend: the gradual loosening and weakening of institutional structure in the pursuit of flexibility, autonomy, and equality.

4.1 When One Size Fits All: The Trouble with Comprehensive Schools

The impact of the comprehensive high school on American secondary education has long been debated. Jeffrey Mirel, for example, raised the question of whether and to what extent the comprehensive high school has contributed to the decline in the quality of secondary education.¹

Globally, secondary education follows two models: the “dual-track system”, separating academic and vocational-technical schools; and the “single-track system”, merging them into comprehensive schools.

¹ Jeffrey Mirel, “The Traditional High School: Historical Debates over Its Nature and Function,” *Education Next* 6, no. 1 (Winter 2006): 14–21.

Across Europe, the dual-track model remains the norm. Vocational and technical schools stand on equal footing with general high schools, enrolling the majority of junior secondary graduates. In Asia, the economic rise of South Korea, Singapore, Taiwan, and Hong Kong during the 1970s–80s was likewise supported by strong vocational systems.

China’s *pre-Cultural Revolution* “tripod system”—comprising general, normal (teacher training), and technical schools, all at secondary level—also functioned effectively. I recall that my elementary teachers, trained in normal schools, taught mathematics and Chinese with solid mastery. While in the factory where I once worked, skilled workers from technical schools were well paid and respected. The dual-track system was dismantled during the Cultural Revolution, but has been largely rebuilt in the reform and opening years.

By contrast, the United States and Canada follow the single-track model dominated by comprehensive high schools, with only a small number of specialized vocational-technical schools or programs remaining in a few states or provinces. Students typically complete twelve years of general schooling before pursuing specialized training.

Courses in comprehensive schools range widely—from applied math to pre-calculus, from typing and woodworking to Advanced Placement. Designed to meet diverse needs, comprehensive schools often resemble the futile task of “pressing down ten fleas with ten fingers”: they struggle to provide college-bound students with rigorous preparation while offering career-oriented students only superficial electives.

In China, a high school’s success is measured by its college admission rate; however in the United States and Canada, by its graduation rate. To maintain high graduation figures, standards are often lowered.

High school dropout remains a persistent challenge in many school districts.² Those uninterested in academics would naturally turn to vocational training, yet the system provides neither adequate preparation nor early employment pathways. Many drift between school and street while others prepare for college.

As a matter of fact, national studies find that students in vocational-technical high schools are less likely to drop out. In states that have maintained these schools—such as Massachusetts and

² buildOn, “Infographic: The Dropout Crisis in America,” *buildOn*, accessed October 2025, <https://www.buildon.org/get-involved/get-updates/infographic-the-dropout-crisis-in-america-2>.

Connecticut—students show markedly higher graduation rates than their peers in regular comprehensive schools.³

Education should evolve from a unified approach in primary school to differentiation in high school, as students vary in temperament, ability, and aspiration and will eventually enter diverse industries and careers. By the senior secondary stage, their paths have already diverged; forcing all students into one track hinders individual growth and deprives society of much-needed skills.

The comprehensive high schools originated in the early twentieth century, but its widespread adoption as the dominant model of secondary education occurred mainly during the 1960s and 1970s. They are intended to promote equality, as part of the movement for “educational democratization”. In reality, however, their lowered standards may have weakened social mobility, widened inequality, and left society more—not less—divided.

Earlier, I emphasized the strength of American education in offering “multiple pathways for talent cultivation”. A dual-track system should be recognized as an essential part of that strength. Unfortunately, this link was cut off in the pursuit of absolute equality, though Europe and much of Asia wisely retained it—offering a fuller basis for reflection.

4.2 When Choice Lowers Standards: The Hidden Cost of Course Selection

Free course selection is often praised for granting students autonomy. In theory, it sounds ideal: whether academically inclined or career-oriented, strong or struggling, every student can choose courses aligned with personal strengths and goals. The system promises freedom, growth, and diversity—virtues long celebrated as engines of Western innovation.

This is true, especially for students with high academic potential. Yet its fruits are not all sweet. For the majority of ordinary students, when freedom exceeds responsibility, rigor is the first to disappear.

Many students tend to avoid demanding subjects, opting instead for easier courses that still count toward graduation. In British Columbia, for instance, students in Grades 10–12 must complete twenty courses, yet only four are required in math and science.⁴ With such minimal requirements, countless students graduate without ever taking senior-level mathematics, physics, or chemistry.

³ Massachusetts Department of Elementary and Secondary Education, *Perkins V Annual Report* (Boston: Massachusetts DESE, 2023); Plank et al., “Sociology of Education,” 2008; and ACTE (Association for Career and Technical Education), *CTE Works!* (Alexandria, VA: ACTE, 2019).

⁴ British Columbia Ministry of Education and Child Care, *Graduation Requirements* 2023.

Moreover, without firm guidance, freedom easily turns into confusion. Many students and parents lack the knowledge to plan wisely, leading to detours, gaps, and needless repetition.

As critics have observed, unrestricted course choice has gradually turned the curriculum, to some extent, into a "*cafeteria-style curriculum*," in which "the appetizers and desserts can easily be mistaken for the main course."⁵ This concern was further developed by Arthur G. Powell, Eleanor Farrar, and David K. Cohen, who argued that the modern comprehensive high school increasingly resembled a "shopping mall," offering an ever-expanding menu of courses that often came at the expense of academic coherence.⁶ This weakens curricular structure and coherence, and makes it more difficult for students to acquire a solid academic foundation.

The consequences are predictable: relatively few students pursue science or engineering. Even among those who begin in STEM programs, roughly one-third switch to other majors due to the difficulty. Over time, this has left North America chronically short of scientific and technical talent.

In particular, the shortage of teachers and students is mutually reinforcing. Given that only about 10 to 15 percent of high school students take physics in the first place,⁷ it is hardly surprising that 2 in 5 of U.S. high schools today lack teachers to offer the subject.⁸ This self-perpetuating cycle makes it increasingly difficult to rebuild a strong foundation in science education.

The current shortage of STEM talent can be traced back to the seeds sown decades ago—when choice began to take precedence over structure.

The tension between freedom and structure runs through all education systems, and China's experience offers a revealing contrast. In the 1920s, China briefly experimented with an American-style credit and class-shifting system but abandoned it within a decade due to public dissatisfaction, returning to the class-based model that ensured greater consistency in educational quality. More recently, when a loophole allowed students to avoid physics in the national university entrance examination, it was quickly closed to guarantee that enough capable students continue studying the

⁵ National Commission on Excellence in Education, *A Nation at Risk: The Imperative for Educational Reform* (Washington, DC: U.S. Department of Education, 1983), 18.

⁶ Arthur G. Powell, Eleanor Farrar, and David K. Cohen, *The Shopping Mall High School: Winners and Losers in the Educational Marketplace* (Boston: Houghton Mifflin, 1985).

⁷ NCES 2023: *Digest of Education Statistics 2023*. Table 225.72: "Program or course enrollments as a percentage of enrollment in grades 11 and 12, 2020–21." Washington, DC: U.S. Department of Education; British Columbia Ministry of Education. 2007: *Health and Well-Being of Children in Care in British Columbia – Joint Special Report*. Office of the Provincial Health Officer. (See Figure 23: "Physics 12 Participation and Pass Rates.")

⁸ U.S. Department of Education, Office for Civil Rights. *Civil Rights Data Collection: Student Access to and Enrollment in Mathematics, Science, and Computer Science Courses and Academic Programs in U.S. Public Schools* (See Figure 1. Percentage of public high schools offering mathematics, science, and computer science courses), 2020–21. Washington, DC: U.S. Department of Education, June 2023.

most demanding of the sciences. Yet the other extreme poses its own problems. As stated above, China’s system still suffers from excessive unification and rigidity.

Elective courses and differentiated teaching are indeed necessary, but they must rest on clearly defined standards tailored to different student types. In this respect, Singapore’s tracking system may provide a useful reference—structured to maintain rigor while allowing flexibility to nurture diverse talents.⁹

4.3 The Missing Class System as a Safeguard for Growth

Free course selection makes fixed classes unworkable, forcing schools to adopt a class-shifting system. Students no longer have a permanent class or homeroom teacher; instead, they move from one subject group to another in a kind of “free-range” state, like the situation in a university. Each grade is typically assigned only one or two counselors to manage course selection and student affairs. This has become the standard administrative model in North American public schools.

For adolescents—especially those in middle school—the class system serves as a vital safeguard for both academic progress and personal growth. A sense of belonging to a community, the care and supervision of a homeroom teacher, teamwork, role models, and close friendships are all indispensable to a child’s development and form an essential part of growing up.

Elementary schools in the United States and Canada still operate under a class-based system with close teacher oversight. But once students enter secondary schools, they are largely left to themselves. Feelings of loneliness and helplessness are difficult to avoid, particularly among introverted children. When the “rebellious phase” of adolescence begins, such isolation can be especially harmful—even dangerous.

My daughter experienced this firsthand. She came to Canada just before entering middle school and soon found herself in a completely different language and cultural environment, feeling isolated and adrift. Looking back, I regret not spending more time with her during that difficult transition.

The lack of guidance and discipline under class-shifting has contributed to a range of adolescent problems—academic disengagement, bullying, substance abuse, and even youth crime. The long-term effects of this system on students’ character development—and ultimately on social

⁹ Ministry of Education, Singapore. *Overview of Secondary Education: Course Options and Subject-Based Banding* (Singapore: MOE, 2024)

order and stability—should not be underestimated. The success of a small number of outstanding students may come at the expense of many others who fall behind.

It is also worth noting that relationships among classmates and between teachers and students differ greatly between East and West. Many of my close friends today are still the classmates I had in secondary school and university. We keep in touch through WeChat groups, chatting, meeting occasionally, and visiting the teachers who taught us decades ago. Such enduring bonds are far less common in the West, where the class system largely disappears after elementary school.

In sum, what is often praised as freedom and flexibility in American secondary schooling has, when taken too far, weakened structure, continuity, and guidance at a critical stage of adolescent growth.

5. Conclusion

The strengths of American education have benefited generations of students and remain an enduring source of vitality. They deserve to be preserved. At the same time, however, the structural weaknesses that have gradually emerged in the education system call for careful re-examination.

As discussed above, the comprehensive high school, together with unrestricted course choice and the class-shifting system, reflects a broader transformation in secondary education—a gradual loosening of its institutional structure. As a result, graduation standards have been lowered, curricular structure and educational continuity have been weakened, and the guidance and sense of community that are essential to adolescent development have been diminished.

Moreover, over the past several decades, frequent curriculum and instructional reforms have also contributed, to varying degrees, to a decline in educational quality—most visibly in mathematics, physics, and chemistry—a trend that raises concerns about long-term innovation and competitiveness.

These challenges have been recognized for decades, yet progress has remained limited, suggesting that their underlying causes have not been fully understood or effectively addressed.

In my opinion, the underlying causes of these problems are twofold. One is the long-standing pursuit of absolute equality in education. The other is a tendency to pursue innovation while neglecting continuity, overlooking—or even denying—that the fundamental mission of education is the transmission of knowledge and culture. Together, these tendencies have repeatedly contributed to tensions or distortions in educational practice.

At the level of institutional structure and governance, some adjustments may deserve consideration:

- In contrast to the comprehensive high school model, systems that provide differentiated tracks for students with different aptitudes could help better balance equity with excellence.
- More stable class and homeroom arrangements, particularly in early adolescence, may provide the stability, mentorship, and discipline that students need to grow into responsible adults.
- While students should retain meaningful choices, they also need a stronger common academic framework, a more carefully sequenced curriculum, and clearer expectations. Together, these would help overcome the excessive flexibility often associated with credit-based systems, provide better guidance, and build a firmer educational foundation.

Such measures would not require abandoning flexibility, but rather placing it within a more coherent, structured, and supportive educational framework.

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About the Author

Dr. Qianruo Shen is an independent scholar and Honorary President of the Educational Quest Society of Canada. Her research focuses on comparative education, particularly educational systems, education policy, and the teaching of mathematics and science. Her work examines educational reform from a comparative international perspective. She studied physics at Peking University, earned an M.Eng. from Beijing University of Aeronautics and Astronautics, and a Ph.D. in Applied Mathematics from Simon Fraser University, Canada.

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