From Minimum Standards to Better Learning Environments: Strengthening Green Building Requirements in Kazakhstan's Public School Construction

Author: Kristina Ryabova
MA in Human Rights and Sustainability (MAHRS),
OSCE Academy in Bishkek

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Kazakhstan is building more schools than ever, with a 650 increase in number of schools constructed in the last six years. These schools will serve generations of children over the next 40 to 70 years.[2] However, current construction standards require only basic safety and hygiene, while leaving air quality and access to natural light to the contractors' conscience and discretion.

At the same time, international research indicates that indoor environmental conditions have impact on students' cognitive performance, attention and well-being. The green certification frameworks, such as OMIR and international systems like LEED and BREEAM, provide proven approaches to optimising these conditions, yet they remain voluntary in Kazakhstan.

The education and health of children should not depend on voluntary measures. Therefore, the introduction of mandatory green certification for public schools would be a long-term investment in educational outcomes and child well-being, while also having the potential to reduce operational costs. What is missing is the political will to make such certification mandatory.

Kazakhstan's education system is under extraordinary demographic pressure

Student enrollment increased by 19% since 2020, with around 3.9 million students attending public schools in 2026. In response, the government accelerated school construction and delivered more than 1,200 new schools over the same period, while eliminating dilapidated ones. Despite these efforts, the country still faces a shortage of approximately 248,000 student places, meaning that many schools remain overcrowded and thousands of schools are to be built.

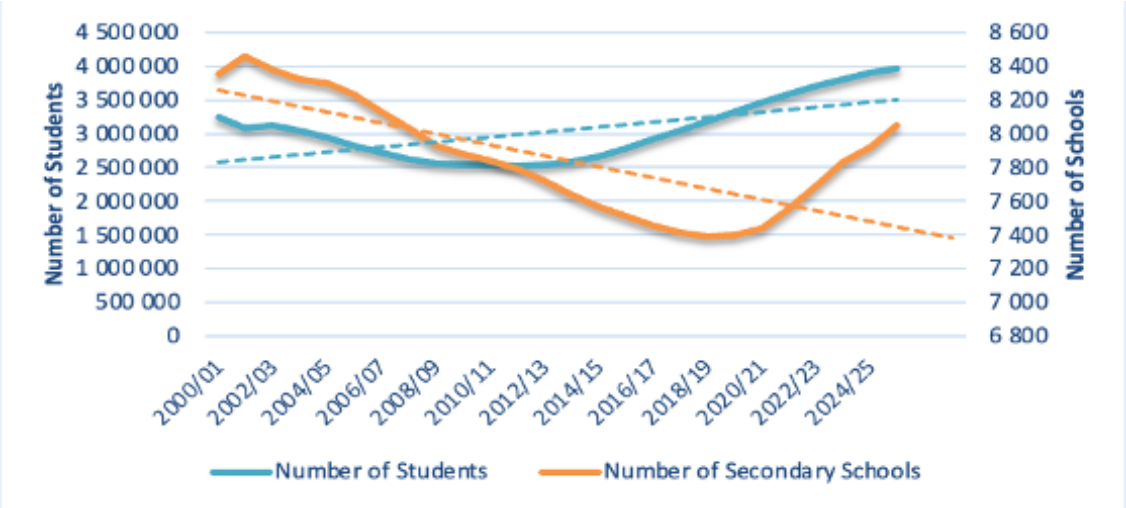


Figure 1. Number of Schools vs Number of Students.
Source of data: Bureau of National Statistics of Kazakhstan

The problem is that Kazakhstan is building 21st-century schools according to minimum standards. While the current regulatory framework ensures basic safety and hygiene, it does not guarantee conditions that support optimal learning. In other words, sustainability aspects are undermined.

The key regulations applied now include:

- SN RK 3.02-11-2011 and SP RK 3.02-111-2012, which govern space allocation and structural design;
- SP RK 3.02-107-2014, which regulates heating, ventilation, air conditioning (HVAC), and fire safety;
- SanPiN Hygienic Rules, which establish minimum requirements for temperature and ventilation.

However, these standards do not require CO_2 monitoring, adequate daylighting, acoustic comfort, or proactive moisture management. As a result, a school can receive full state approval despite having technical aspects limiting students' performance and health.

Better Buildings = Better Learning

The positive relationship between indoor environmental quality and student outcomes is proven by researchers from the United States, Europe, and Asia. Their evidence focuses on four key factors: ventilation and indoor air quality (measured by CO_2 concentration), thermal conditions, daylight, and acoustics. Together, these elements shape the learning environment, with studies showing that optimising them can improve cognitive performance by 5-20%, while certain cognitive functions show gains of more than 200%.

Ventilation and indoor air quality. Harvard's COGfx study found that reducing indoor CO_2 levels from ~1,400 to ~550-600 ppm through improved ventilation increased cognitive function scores by 288% for strategic thinking, 299% for information usage, and 131% for crisis response. Among schoolchildren, elevated CO_2 concentrations are also associated with approximately a 5% decline in attention, an effect comparable to skipping breakfast.

Thermal conditions. Kazakhstan's standards require classroom temperatures of 18-21°C. Meanwhile, research shows that even small temperature differences within the comfort range affect learning outcomes. Wargocki and Wyon found that every 1°C reduction in classroom temperature (within the 20-25°C range) improved students' work rate by approximately 4%. Similarly, a study of 75,000 high school students by Park found that the probability of failing an exam was 12.3% higher on a 90°F (32°C) day than on a 75°F (24°C) day.

Daylighting. Elementary school classrooms with higher window-to-wall ratios and dynamic daylight controls achieved learning progression rates that were 7-26% faster in reading and mathematics over a single academic year. Studies also show that students with views of greenery recover more quickly from stress and perform better on attention-related tasks

The Standards Gap: Kazakhstan Already Has the Tools Which Are Not Popular

Kazakhstan does not lack green building standards, but it lacks their mandatory application. The country has its own contextualised certification frameworks: OMIR, developed through the Kazakhstan Green Building Council, and Green Standard of Kazakhstan 2017 (ST RK 2398-2018). In addition, the government's "Comfortable Schools" programme incorporates several green building principles into its technical specifications.

The question, then, is not simply whether Kazakhstan has the standards to build greener schools, but to what extent making them mandatory is needed to improve learning outcomes. In response, a comparison of building standards and PISA performance in Kazakhstan and high-performing education systems shows that stronger requirements for the quality of learning environments tend to accompany stronger educational outcomes, which suggests that building standards should be considered as part of a broader policy agenda.

In the 2022 PISA assessment, only 50% of Kazakhstani students achieved minimum proficiency in mathematics, compared with the OECD average of 69%. The figures were even lower in reading (36% versus 74%) and science (55% versus 76%). Only 2% of students reached top performance levels in mathematics and 1% in reading, compared with OECD averages of 9% and 7%, respectively. Although these results are shaped by many factors, the quality of school buildings is one of the few determinants that governments can improve directly through public policy in a relatively short time.

The contrast with high-performing education systems is stark

Table 1. Comparison of building certification frameworks and PISA performance in selected countries
Source of PISA data: World Population Review (2026)

Singapore	Green Mark certification mandatory for all public infrastructure; 80% target by 2030	Best PISA performer
Estonia	EU energy and indoor environmental directives strictly enforced	Top-10 PISA performer
Japan	CASBEE certification for public buildings	Top-10 PISA performer
Kazakhstan	OMIR voluntary; rarely applied to public buildings	Below OECD average in PISA

It is impossible to change curricula or teacher quality overnight. But we can change how we build schools tomorrow with the tools that are ready. The only missing element is the political will to use them.

Recommendations

Embed specific IEQ performance parameters into state normative documents for new school construction. Rather than mandating privately administered certification, the Ministry of Education and the Ministry of Industry and Construction should adopt current regulations to set enforceable numeric thresholds, such as CO_2 capped at 1,000 ppm, minimum window-to-wall ratios for daylighting, background noise below 45 dBA, directly into the Technical Assignment at the design-brief stage. Because these become state codes, Gosexpertiza can review compliance the same way it already reviews structural code with no added dependency on a third-party certifier.

Set a separate, phased IEQ upgrade requirement for capital repairs of existing schools. Akimats, which control capital-repair budgets, should require the same core parameters in repair-project technical specifications. This uses an existing budget line and existing prioritisation data, rather than requiring new funding or new data collection.

Consider tax incentives to private contractors and material/equipment suppliers who exceed the mandatory floor. For instance, the state might consider a corporate income tax credit or accelerated depreciation, via the Ministry of Finance or Ministry of National Economy, for firms constructing schools certified to internationally recognized standards (LEED, BREEAM, EDGE) above the state minimum. This creates upward market pressure without making certification itself the compliance gate.

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