Safe Schools

TECHNICAL GUIDANCE NOTE

DRAFT FOR CONSULTATION

The Role of the Physical Learning Environment for Supporting Safe Schools

Safe Schools Practices Package

WORLD BANK GROUP

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Abbreviations

AN	Approach Note
EMIS	Education Management Information System
FCV	fragility, conflict, and violence
ICT	information and communications technology
LMIC	low- and middle-income country
M&E	monitoring and evaluation
MHH	menstrual health and hygiene
OECD	Organization for Economic Co-operation and Development
PLE	physical learning environment
T&L	teaching and learning
TLM	teaching and learning material
UNESCO	United Nations Education, Scientific and Cultural Organization
WASH	water, sanitation, and hygiene

Executive Summary

School safety is a critical contributor to positive student, teacher, and school-level outcomes. Schools are safe when *all* students, teachers, and staff can thrive in a welcoming environment that supports learning, health and well-being, and positive relationships. Promoting school safety should consider the physical and remote spaces in which education takes place as well as the non-physical aspects of the school environment, such as norms and values. School safety comprises five main characteristics—each of which can impact the level of safety of students, teachers, and the teaching and learning (T&L) environment. The characteristics include physical safety, mental health and emotional well-being, instructional practices and environment, interactions and relationships, and school connectedness.

Safe and inclusive schools are 1 of the 5 pillars of the World Bank's vision **for the future of learning and a key aspect of** learning recovery **efforts.** The COVID-19 pandemic amplified the importance of student and teacher safety and is an opportunity for education systems to adopt a whole-and-beyond-the-school approach that addresses risks to school safety. Safe Schools is the World Bank's program to assist countries to design and implement sustainable safe school policies and practices.

A review of global guidance on how to support and sustain safe school policies and practices identified three key steps, which are outlined in the *Approach Note: Global Guidance for Supporting and Sustaining Safe Schools*. The steps are to (1) diagnose risks to school safety, (2) design and implement safe school strategies, and (3) monitor and evaluate school safety (figure 1).

Step 1: Diagnose Risks to School Safety. Step 1 recommends diagnosing risks to school safety by identifying local, regional, or national factors that can influence safety levels. Step 1 recognizes that school safety can be influenced by the country or regional context; community norms; and the relationships among schools, students, and teachers. School safety also can be influenced by unexpected shocks from natural hazards including those exacerbated by climate change, epidemics, or pandemics. Moreover, the local context can influence the physical, mental, emotional, and social well-being of an individual and impacts an individual's growth. Step 1 outlines the critical factors that can be diagnosed at the country, regional, and/or school level and provides guidance on how to measure safety levels.

Step 2: Design and Implement Safe School Strategies. Step 2 synthesizes global evidence and experiences by outlining *universal* and *targeted* supports that can help education systems promote and improve school safety levels. Universal supports for safe schools are the (a) management practices, (b) teaching and learning (T&L) practices, and (c) physical learning environment (PLE). The available evidence highlights all three universal supports as key levers to address school safety. These three strategies are correlated with enhanced school safety, but they are not sufficient to address all safety risks. In addition, targeted supports, typically executed through a tiered approach, may need to be designed and implemented to meet specific identified needs. Step 2 lays out practical, evidence-based strategies for implementing universal and targeted supports complemented by country case studies.

This Guidance Note on *The Role of the Physical Learning Environment for Supporting Safe Schools* builds on the PLE strategies presented in the Approach Note. This Note provides additional details, resources, and country case studies that offer richer details on why and how countries have employed these strategies.

Step 3: Monitor and Evaluate School Safety. Step 3 **emphasizes the need for monitoring and evaluation (M&E) of school safety levels and implementation efforts to adapt supports to**

changing needs. The AN provides a brief overview of global M&E practices in the context of school safety and builds on the design and implementation country case studies to highlight how systems can monitor and evaluate their interventions. The guidance provided in step 3 is complemented by the *Measuring School Safety* PPT, which lays down how education systems can diagnose, monitor, and evaluate safe school risks and practices.

Figure 1. Three-Step Process to Address School Safety Risks

Step 1	Step 2	Step 3
Diagnose Risks to School Safety:	**Design and Implement Safe School Strategies:**	**Monitor and Evaluate School Safety:**
Diagnose and define the magnitude of context-relevant risks to school safety by identifying local, regional, or national factors that can influence safety levels.	Use diagnostic evidence to design and implement universal and targeted supports that can promote and improve school safety levels.	Monitor school safety levels and evaluate implementation efforts to adapt supports to changing needs.

Safe Schools Practices Package *(downloadable resources)*

1. Diagnose	2a. Universal Supports	2b. Targeted Supports	3. Monitor and Evaluate
Measuring School Safety	Role of Management Practices Role of Teaching and Learning Practices Role of Physical Learning Environment	Supporting Mental Health and Psychosocial Well-Being in Schools Resource Guide on Violence Prevention and School Safety	Measuring School Safety

Introduction

As part of the *Safe Schools Practices* guidance package, this Note aims to provide global guidance on the role of physical learning environments (PLEs) in supporting and sustaining safe schools (see box 1 for definition of safe schools). The Note presents evidence and strategies for improving the safety of PLEs in low- and middle-income countries (LMICs) and provides representative case studies to illustrate proposed interventions and recommended additional sources of guidance.

PLE refers to spaces in which learners, teachers, content, equipment, and technologies interact,[1] as well as to the network of learning facilities commonly referred to as school infrastructure. The PLE includes the school as a whole (that is, classrooms, libraries, playgrounds, toilets, kitchen, sports facilities, etc.), and refers to buildings, amenities, outdoor spaces, furniture, equipment, learning materials, and other similar physical elements. It represents the physical aspects of the learning environment that enhance learning engagement and inclusion. This Note also considers the surrounding neighborhoods and routes to schools that students and staff engage with as a component of the PLE. At a systems level, the PLE encompasses the network of interconnected school facilities whose condition, capacity, and operation are defined by the expected level of service required to support the delivery of education services. On this macro scale, PLEs are usually referred to as school infrastructure. This system is molded by and dependent upon not only the functioning and resources of the education system itself but also by external factors beyond the school domain, like the provision of public services such as power, water and sanitation, communications, transportation, building and land use regulations, supply chains, and emergency management.

Box 1. Safe Schools Description

Schools are safe when *all* students, teachers, and staff can thrive in a welcoming environment that supports learning, health and well-being, and positive relationships. "Schools" refers to any setting in which learning occurs, be it virtually or in person, formal or informal. Promoting school safety should consider the physical and remote spaces in which education takes place as well as the non-physical aspects of the school environment, such as norms and values. **School safety can be understood by looking at five main characteristics—**each of which can impact the safety levels of students, teachers, and the environment in which the teaching and learning occurs.

The five main characteristics of school safety are:

1. **Physical Safety**

   Safety from risks that can cause bodily harm in school or on the way to and from school, for example, from aggression, including acts of physical or sexual violence and abuse; the school physical infrastructure; or health conditions/diseases such as those that stem from poor nutrition, contaminated water, and inadequate water, sanitation, and hygiene (WASH) services.

2. **Mental Health and Well-Being**

   Prevention of negative stress and symptoms of anxiety, depression, and other negative thoughts and feelings; as well as protection from psychological violence, including aggressive, harassing, disruptive and other emotionally harmful behaviors and actions of students, teachers, and/or school staff.

3. **Instructional Practices and Environment**

   Safety derived from the practices and environment in which learners, teachers, content, equipment, and technologies interact to enhance learning engagement and inclusion.[2] Instructional practices encompass the non-physical elements including teaching and learning practices; curriculum, pedagogical resources, learning materials, culture, and management. Instructional environment encompasses the physical elements including classrooms, equipment, libraries, playgrounds, toilets, kitchens, and sports facilities.

4. **Interactions and Relationships**

   Positive interactions that promote social and emotional learning (SEL) and inclusion. Interactions include (a) student and teacher, (b) peers (student-student; teacher-teacher; teacher-school leader), and (c) school-community.

5. **School Connectedness**

Partnerships and engagement of school with the (a) families; (b) community; (c) other schools in the cluster, for example, for teacher professional development (TPD); (d) local referral services to clinics, counselors, and psychologists; (e) local after-school and extra-curricular providers; (f) museums, research institutes, and businesses; and (g) local/national disaster risk management (DRM) teams/services.

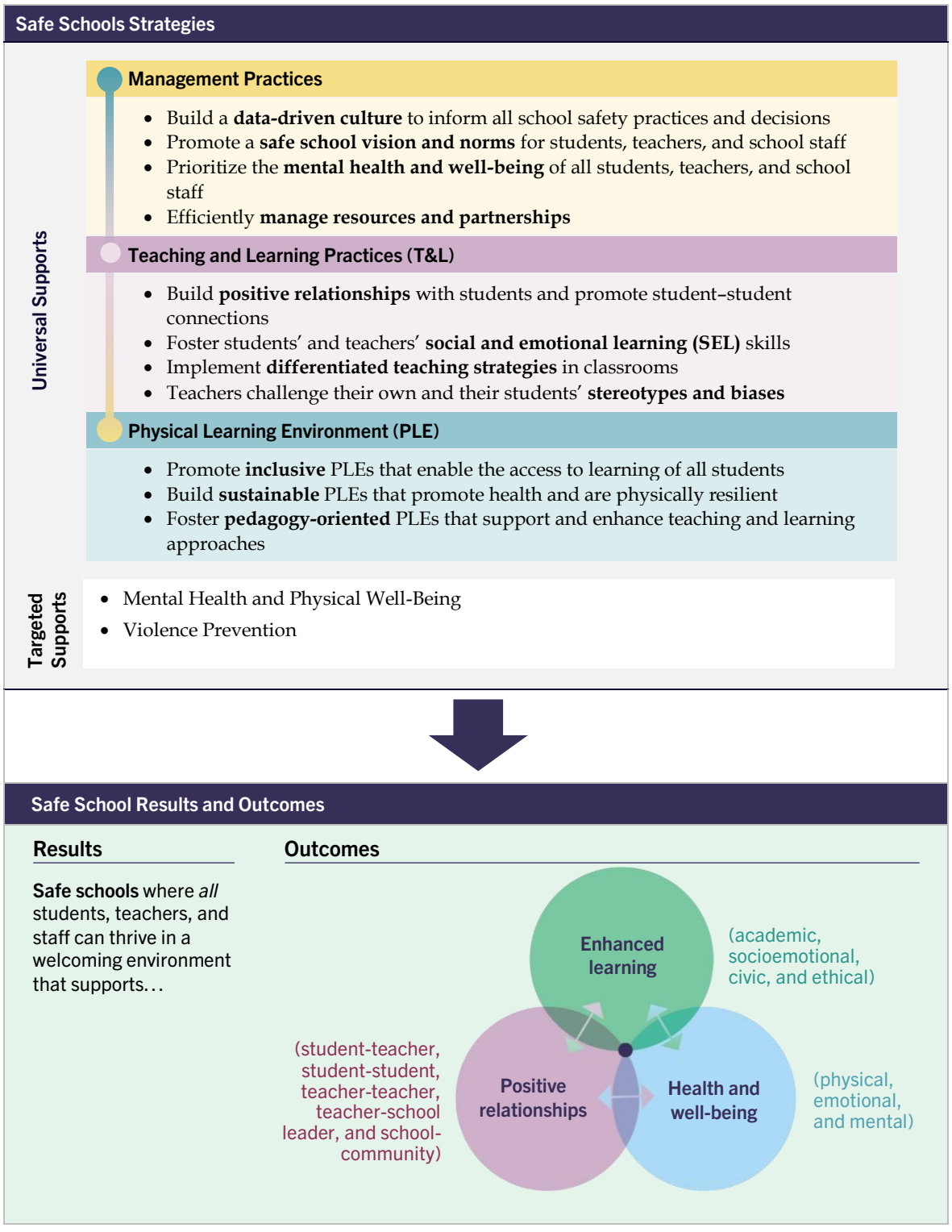
Effective PLEs—including school classrooms, facilities, and their supporting network of connected infrastructure—are an integral component of school safety, fostering learning, health, and relationships.[3] Increasing the availability of classrooms and decreasing the distance of travel to classrooms has been shown in many countries to improve school attendance[4,5] and to produce long-term economic and health benefits, including improvements in living standards, particularly for girls. Furthermore, improvements to the quality of the PLE, including limiting overcrowding, contribute to enhanced learning outcomes.[6,7] Access to adequate water, sanitation, and hygiene (WASH) services in schools has been linked to better health and increased attendance rates for

girls.[8,9,10] The architectural and spatial design of learning environments also influences personal relationships.[11,12]

A review of global evidence and experiences identified three PLE strategies that can help education systems and schools promote and improve school safety levels (figure 3). These strategies correlate with enhanced school safety levels and build on the World Bank's evidence-based guidance from the Roadmap for Safer and Resilient Schools and the Global Library of School Infrastructure (GLOSI), developed by the Global Program for Safer Schools (GPSS), as well as the Water Global Practice's Operational Toolkit for WASH in Educational Settings and its report The Impact of School Infrastructure on Learning, among other resources.

It is essential to note that PLE strategies are intertwined with other practices that affect school safety. For this reason, education systems and schools are encouraged to take an integrated approach to school safety (figure 2). Evidence of effective practices for supporting safe schools highlights the areas of management practices, T&L practices, and the PLE, as levers for system-level school safety reforms. The World Bank's *Global Guidance for Supporting and Sustaining Safe Schools* Approach Note (AN) highlights these areas and provides a general overview on school safety challenges and mitigation approaches. This Note expands on the PLE strategies outlined in the AN and provides country case studies and resources for how education systems can consistently practice safe school measures by applying effective PLE practices. Depending on context and needs, the guidance in this Note can be coupled with the strategies on management and T&L practices.[13] For details on how to support safe schools through management and T&L strategies, refer to the corresponding Notes from the *Safe Schools Practices* guidance package.

Figure 2. Physical Learning Environment: One of the Three Levers for School Safety Reforms



Objective

The objective of this Note is to provide global guidance on the role of PLEs to support and sustain safe schools. The Note includes resources and country case studies that offer richer details on why and how countries have employed these strategies and provides additional evidence on the role of PLEs in fostering learning, health and well-being, and relationships.

The Note is intended to be used by policymakers, practitioners, school leaders, and/or teachers who are engaged in preparing school infrastructure standards, strategies, plans, programs, and projects. The strategies reflect the need for complementary efforts at scale and within individual school communities. At national and/or regional levels, the planning, design, and construction of new schools should prioritize the safety, sustainability, and efficiency of school infrastructure investments, including both the construction of new schools and improvements to existing PLEs. At the school level, school communities should proactively address identified safety shortcomings in PLEs where possible and fill gaps in support from higher-level authorities. While all PLE strategies are relevant to the creation of safer schools, some interventions may be a higher priority for some contexts than others depending on the main challenges they face (for example, natural hazards or community violence).

This Note is part of the larger *Safe Schools Practices* guidance package (figure 1). The package includes a chapeau Approach Note (AN) *Global Guidance for Supporting and Sustaining Safe Schools*, which describes a three-step process for addressing school safety risks. The package also includes an accompanying PPT on *Measuring School Safety*, and five Guidance Notes on (1) Role of Management Practices, (2) Role of Teaching and Learning Practices, (3) Role of Physical Learning Environment, (4) Supporting Mental Health and Psychosocial Well-Being in Schools, and (5) Resource Guide on Violence Prevention and School Safety.

Physical Learning Environment Challenges for Safe Schools

To support safe schools and ultimately learning, PLEs must be inclusive, physically resilient and sustainable, and pedagogy-oriented; they should also be a source of pride for communities. In most places in the world, PLEs are the formal, public infrastructure with which communities have the most regular, extended, and meaningful contact. School-age children and their teachers spend up to half their waking hours in PLEs. Oftentimes PLEs also serve important community functions, such as gathering spaces for community events, election polling stations, and emergency shelters in times of disaster. Yet LMICs face challenges related to PLEs that reduce school safety and ultimately the safety of students and teachers as well as the effectiveness of the education system.[14]

Challenge 1: PLEs in many LMICs exclude large portions of the population from access to education, either due to an insufficient supply of classrooms or because their physical conditions restrict or discourage the participation in learning of the most vulnerable population groups, including girls and those with disabilities. Due to limited government resources to strategically plan and invest in school infrastructure, PLEs tend to be insufficient in number and capacity at both primary and secondary levels and inequitably distributed geographically. In Angola, nearly 20 percent of the country's classrooms, representing approximately 1.12 million students, operate in the open air under trees.[15] Schools are often overcrowded, poorly maintained, and require extensive travel to reach each day, factors that have the most significant impacts on students from the most disadvantaged groups, including girls. In Uganda, more than 55 percent of lower-secondary school children walk more than 30 minutes to reach school.[16] In rural Côte d'Ivoire, longer distance to school was found to be correlated with child workforce participation.[17] Many countries address supply

issues using a shift system, which significantly reduces the time each student spends learning each day. PLEs can also contribute to negative behaviors and relationships, including bullying and gender-based violence, especially in situations where they are in disrepair, unsupervised, or isolated, or when they have inadequate lighting and shared gender WASH facilities.[18] These physical conditions contribute to a general feeling of insecurity and danger at school, particularly for girls, reducing the likelihood of attendance and opportunities for learning. For example, in the Democratic Republic of the Congo, shared gender toilet facilities were identified by teenage girls as the most likely locations for sexual violence and were therefore avoided during school hours.[19]

Challenge 2: Many PLEs are physically unsafe and offer poor indoor environmental conditions, putting students at daily risk of infectious disease, injury, and death. PLEs in many LMICs were built multiple decades ago before building regulations considered the need for hazard-resistant design, or, in some cases, without any formal regulatory process at all. In some countries today, even new schools are being built without consideration of natural hazard exposure. Furthermore, due to decades of underinvestment in maintenance and growing exposure to climate hazards, many PLEs pose safety risks to students and staff. According to the World Bank's Global Baseline of School Infrastructure,[20] 1 million school buildings are vulnerable to natural hazard damage and an average of 2,500 school children are at risk of being killed by a collapsing school in an earthquake on an annual basis. In conditions of fragility, conflict, and violence (FCV), PLEs are often the target or collateral damage of violent acts, further exposing children to risk and reducing the availability of PLEs. Eleven thousand such attacks were reported between 2015 and 2019.[21] In addition to physical safety risks, poor-quality and physically vulnerable PLEs risk disrupting the delivery of education, for example when a school must close for weeks or months following a natural disaster event or attack. In Burkina Faso, during 2021 school year, 2,877 schools were closed due to damage caused by attacks (mainly arson) from terrorist groups (as of October 31st).[22] Greater physical resilience in PLEs and better contingency planning (for example, hybrid learning and temporary facilities) are needed to reduce the disruption of education due to natural and man-made shocks and stresses and to improve the resilience of the education system. Poor indoor environmental quality, WASH conditions,[23] and overcrowding can also contribute to the spread of infectious diseases and limit students' participation in education.[24] In India, a study found that 25 percent of girls do not attend school during menstruation because of poor WASH infrastructure.[25] Health and safety challenges have been exacerbated in the past several years by the COVID-19 pandemic and will continue to mount as the effects of climate change worsen, making climate change mitigation, sustainability, and resilience interventions even more urgent. In South Sudan, many schools are unreachable or occupied by displaced populations during the rainy season, and during the hot season, many children do not attend school as they lack water and risk dehydration.

Challenge 3: Most PLEs were designed to support only traditional pedagogical practices and lack adequate teaching and learning materials (TLMs), creating limitations in how teachers and students can interact, build relationships, and learn. Research over the past several decades has demonstrated the link between the design and physical conditions of PLEs and learning outcomes,[26,27,28] shedding further light on disadvantages and lost opportunities for learning caused by existing underperforming PLEs. For example, an analysis of data from 21 sub-Saharan African countries showed that when the condition of PLEs changes from "extremely bad" to "extremely good," student performance increased by 10 percent of a standard deviation.[29] The existing inventory of school infrastructure in most LMICs is not only insufficient due to the reasons stated above, but is also not able to support evolving pedagogical practices like teamwork or specialized activities. Similarly, the lack of appropriate and sufficient TLMs such as furniture, technology, and textbooks reduces opportunities to learn.[30] In Ghana, 34 percent of teachers surveyed stated that insufficient TLMs were a barrier to education, and in particular, disability-inclusive education.[31]

Physical Learning Environment Strategies for Safe Schools

A review of global evidence and experiences identified three evidence-based PLE strategies that can help education systems promote and improve school safety levels (figure 3).

Figure 3. Summary of Physical Learning Environment (PLE) Strategies for Safe Schools

Education systems and schools build and maintain physical learning environments (PLEs) that are inclusive, physically resilient and sustainable, and learning oriented.

1. PROMOTE INCLUSIVE PLEs

A. Enable **access for each student** to a PLE at a reasonable distance from home and accessible by a safe travel route.
B. Ensure new and existing PLEs are **gender-friendly** to eliminate barriers contributing to gender disparities in education.
C. Make new and existing PLEs **accessible and accommodating to students with disabilities** to allow for meaningful participation in all learning activities.
D. Use PLEs to foster positive relationships and social cohesion.

2. BUILD SUSTAINABLE AND PHYSICALLY RESILIENT PLEs

A. Ensure PLEs meet **adequate standards for basic infrastructure** service provision and indoor environmental quality (IEQ).
B. Make PLEs **physically resilient** to protect health and physical safety and to minimize the disruption of education.
C. Make PLEs **sustainable** to reduce negative environmental impacts and avoid exacerbating future climate and safety risks.

3. FOSTER PEDAGOGY-ORIENTED PLEs

A. Create **child-centered** PLEs that promote learning through naturalness, individuality, and stimulation.
B. Design PLEs to adapt to evolving pedagogies and support diverse types of learning.
C. Provide **adequate learning materials, including ICT** for blended education modalities.

1. PROMOTE INCLUSIVE PLEs

Promote inclusive PLEs that enable the access to learning of all students. Inclusive PLEs are those that promote equitable learning opportunities and foster positive relationships through their planning and design.

Why

PLEs play a critical role in promoting inclusion. A sufficient supply of classrooms that are equitably distributed is needed to ensure access to education, particularly for students of the most disadvantaged populations living in poor or isolated areas. Well-planned and -designed PLEs can also reduce the barriers to female school attendance and learning, which include long travel distances that increase the opportunity costs of attending school, concerns about safety at school and in transit, and inadequate WASH services that do not support menstrual hygiene. PLEs can also support the full participation in learning of students, teachers, or staff with disabilities when they are designed to be accessible. Finally, the design of PLEs can influence relationships and promote positive behaviors and social cohesion, contributing to more welcoming and inclusive schools.

How

A. Ensure access for each student to a PLE that is within a reasonable distance from home and can be reached by a safe travel route:

1. To ensure that all students have a classroom seat, government authorities should: (a) prioritize investments in new construction and expansions to existing schools to provide sufficient classrooms for current and future student populations; and (b) efficiently plan the school infrastructure network to ensure that school sites are well-distributed with reasonable catchment areas for the different education levels, particularly in the most vulnerable communities. In rural and pastoralist communities, where there tend to be high levels of out-of-school children, alternatives to traditional PLEs such as mobile schools or boarding school options could also be considered.

2. School communities and administrators must support investment planning by collecting and sharing data with the government for better decision making. Specifically, they should share data on demographics as well as school building inventories and conditions (for example, insufficient, unsafe, or aging buildings and other infrastructure).

3. School communities and administrators can also use hot spot mapping and "safe routes to schools" approaches to further improve safety and accessibility of travel routes to school, particularly for girls, as well as secure the perimeter and immediate vicinity of school grounds.

4. School transportation services must be provided for those with disabilities and where schools cannot be reasonably or safely accessed by public transportation or on foot or bicycle. This can also be done by less formal means. For example, in The Gambia, donkey carts are used to transport young children and those who cannot easily walk up to 3 km to school each day as part of a broader strategy to enhance equitable access to education.[32]

Case Study

In Colombia, the municipality of Cali developed a long-term school infrastructure plan in 2018 to manage the school portfolio efficiently and increase the supply of classrooms in the city to advance elimination of the two-shift system and allow a full school day for every child. An additional objective of the school construction program was to prioritize the replacement or retrofit of existing schools that were identified as highly vulnerable to earthquakes. To ensure an efficient and forward-looking investment, the planning process factored in anticipated population growth and demographic changes in the region and sited new school locations using the results of an optimization of travel routes based on the existing municipal transportation network.[33] To promote an inclusive approach, municipal planners leveraged city staff and school administrators to collect data on the physical characteristics and shortcomings of school facilities and used these to objectively prioritize interventions. Local factors related to security, such as the existence of "invisible boundaries" of gang activity that impacted access to school were also considered in the planning and design of individual schools.[34] To date, Cali has retrofitted and rebuilt numerous schools, improving learning and safety and moving closer to elimination of the shift system citywide.

B. Ensure new and existing PLEs are gender-friendly to eliminate barriers contributing to gender disparities in education:

1. School design and construction standards should guide minimum requirements for gender-friendly facilities. In particular, WASH facilities must be of sufficient capacity, separated by gender, private/lockable, and supportive of menstrual health and hygiene (MHH) (for example, waste bins, handwashing stations, MHH rooms).

2. Every new school built should proactively encourage the creation of PLEs that address female health needs and security concerns. Making schools gender-friendly, including improvements to WASH services, should also be prioritized for every existing school rehabilitation.

3. Monitoring and evaluation of the physical accommodations to provide gender-friendly facilities should be incorporated into government EMIS (Education Management Information Systems), along with other data on conditions of PLEs.

4. Appropriate management practices are also essential to fostering equitable PLEs, for example by ensuring adequate accountability and funding for ongoing operation and maintenance of WASH and MHH services, providing necessary cleaning and menstrual hygiene supplies, and pairing PLE interventions with training and education. *Note: Interventions related to security and preventing gender-based violence, which also relate to the creation of gender-friendly PLEs, are addressed below.*

Case Study

In Angola, the Girls Empowerment and Learning for All Project,[35] financed by the World Bank, aims to reduce gender inequalities and female learning poverty in the education system and make economic growth more inclusive in a country expected to have a 30 percent increase in the school-age population by 2030. Currently, 34 percent of adolescent girls are out of school, only 15 percent complete secondary education, and 22 percent have zero schooling. The

country has the third-highest adolescent childbearing rate worldwide, and 51 percent of women are illiterate. In addition to providing financial incentives for girls to continue from primary to secondary school, and introducing WASH education and school-related gender-based violence risk mitigation services, the project is expanding the supply of secondary-level classrooms and making existing schools more gender-friendly in regional "hot spots" of high child marriage and adolescent childbearing. New school construction will reduce current travel distances of up to 12 km, a barrier to female attendance. As part of the project, the Ministry of Education is developing new School Construction Guidelines and model school designs that will apply a "gender lens," especially for WASH services, including ensuring separate, secure latrines, using the guidance provided in the World Bank's WASH in Educational Settings Toolkit.[36] The project will also build WASH facilities in existing schools, 60 percent of which have no functioning toilets. The project is expected to be completed by 2025 to create 135,000 new school seats for girls.

C. Make new and existing PLEs accessible and accommodating to students with disabilities to allow for meaningful participation in all learning activities:

1. Government authorities in charge of new school construction and rehabilitation of existing schools should prioritize enhanced accessibility for students with physical disabilities to allow meaningful access and engagement in all learning, relationship-building, and health-promoting activities. This includes access to classrooms, specialized learning areas, canteens, WASH services, and recreational and play spaces. It has been shown that integrating accessibility standards into new construction in the planning stage has a negligible impact on total construction cost (approximately 1 percent).[37] Monitoring and evaluation of the physical accessibility of PLEs should be included in government EMIS, along with other data on the conditions of PLEs.

2. Government authorities and school administrators should promote universal design and reasonable accommodation in facilities, furnishings, equipment, and services to accommodate those with physical, sensory, or intellectual disabilities. This includes assistive technology devices to accommodate diverse abilities and learning needs.

3. Where existing PLEs are not accessible to those with physical or other disabilities, school communities can mobilize to undertake small-scale adaptations to facilities or improvements to furnishings and equipment to meet the specialized needs of those in their community.

Case Study

In Ghana, the government developed standards and guidelines to ensure schools' physical accessibility in 2015, including buildings, ramps, walkways, WASH facilities, etc. This was done in the context of a broader national effort to promote the inclusion of students with disabilities, starting with the Ghana Disability Act 2006. These standards are mandatory for all educational institutions, which must apply and adhere to them.[38] As part of the Greater Accra Metropolitan Area (GAMA) Sanitation and Water Project, which targets urban areas lacking adequate WASH services, over 400 sanitation facilities in schools were newly built or renovated according to these standards over the past several years, including providing disability-inclusive toilets and handwashing facilities that are separated for boys and girls.[39] These interventions to improve access were paired with others targeting MHH, such as changing rooms for girls and sanitary pad disposal bins, as well as MHH education.

D. Use PLEs to foster positive relationships and social cohesion:

1. Government agencies in charge of school planning and construction should promote PLE designs as a tool to discourage school-based violence and promote positive social interactions. To this end, it is important to develop minimum standards and requirements for the size, configuration, and location of communal and circulation spaces, site security measures, and WASH facilities.

2. School communities can use participatory approaches to identify and mitigate hot spots for school-based violence, including ensuring that indoor and outdoor PLEs are well-lit with adequate surveillance.

3. School communities can foster greater social cohesion through community and family engagement in the use, operation, and maintenance of PLEs to promote physical safety and positive relationship building. This can be done by allowing school communities to customize PLEs with locally available materials and culturally appropriate designs to engender pride in and ownership of school facilities. The use of indigenous approaches has the added benefit of ensuring that PLEs can be sustainably and cost-effectively operated and maintained in the long term. Another approach to foster social cohesion is to encourage the use of PLEs by the broader community during off-hours as part of a whole-school approach (for example, as school event spaces, classrooms, libraries, recreational facilities, and gardens).

Case Study

In 54 schools in the Democratic Republic of the Congo, the USAID-funded project "Empowering Adolescent Girls to Lead through Education"[40,41] used participatory mapping to identify physical spaces that were viewed as "hot spots" for school-related gender-based violence. In separate groups, girls and boys drew maps of the school buildings and grounds, including roads and paths around the schools, and placed green dots in spaces where they felt safe and red dots in places where they felt unsafe, such as toilets, empty classrooms and corridors, staff offices, and the perimeter of school grounds. This information was used to prioritize small grants to parent-run committees at the schools to mitigate the "hot spots" by improving lighting, fixing broken locks, and improving supervision and monitoring of PLEs. Similar participatory approaches have been used in schools in Vietnam, Ghana, Malawi, and Zimbabwe.

Do You Want to Learn More About Building Inclusive PLEs?

- The UNESCO International Institute for Educational Planning has a website with policy options for addressing the challenge of school distance.
- Refer to the World Bank's Inclusive Education Resource Guide: Ensuring Inclusion and Equity in Education, which includes guidance for inclusive PLE planning and implementation.
- UNESCO's 2020 report School Accessibility and Universal Design in School Infrastructure provides a wealth of information on accessibility and universal design in PLEs based on evidence from five countries.
- See Japan's A Collection of Exemplary Design of School Facilities for Special Needs Education for concrete design examples of disability-friendly PLEs.
- UNICEF's Inclusive Education Booklet Collection provides practical guidance on a range of topics related to disability-inclusive education, including Booklet 10, which covers PLEs.
- A Landscape Review of ICT for Disability-inclusive Education explains which tools can be introduced to PLEs to improve inclusivity.
- The following resources provide more information on gender-friendly PLEs and WASH facilities: UNOPS's Infrastructure for Gender Equality and the Empowerment of Women and the World Bank's Menstrual Health and Hygiene Resource package, including checklists for the design of inclusive facilities. See also the World Bank's WASH in Educational Settings Toolkit.
- For guidance on reducing violence in PLEs, refer to Section 6 of the WHO's School-based Violence Prevention Handbook and UNESCO's Global Guidance on Addressing School-Related Gender-Based Violence.

2. BUILD SUSTAINABLE AND PHYSICALLY RESILIENT PLEs

Build sustainable PLEs that promote health and are physically resilient. Sustainable and physically safe and resilient PLEs are those that are planned and designed to perform safely and effectively over time in the face of more frequent natural and man-made shocks and stresses.

Why

PLEs must protect the health, well-being, and safety of students and staff who spend much of their waking hours within them. PLEs should ensure basic comfort such as light levels and temperature to allow for learning and provide adequate ventilation, physical space, clean water, and hygiene sanitation to reduce the risk of infectious disease. PLEs must be planned through risk-informed approaches and well-built to minimize the likelihood of damage, injuries, and death in the event of natural or man-made disasters, to reduce the disruption of education services from disasters, and to adapt to and mitigate climate change.

How

A. Ensure PLEs meet adequate standards for basic infrastructure service provision and indoor environmental quality:

1. Government authorities must plan school infrastructure at scale in conjunction with investments in centralized or regional water, power, and transport infrastructure to ensure that efforts are coordinated. EMIS should include data on the availability and adequacy of basic services.
2. Authorities in charge of school design and construction should also develop, promote, and enforce context-appropriate minimum school design and construction standards for indoor environmental quality, including requirements for physical space per student, natural and artificial light, ventilation, temperature, acoustics, and nontoxic materials, as well as WASH services.
3. Where existing PLEs lack centralized services or centralized service provision is not feasible, authorities should assist school communities to develop localized or distributed sources of water, sanitation, or power such as rainwater capture or construction of boreholes and solar power, which have the added benefit of being more environmentally friendly.
4. School communities should use local resources and efforts to improve the quality and sustainability of indoor environments by introducing equipment and materials such as window shades, fans, and acoustic-dampening finishes. The participation of school communities in maintenance also supports the indoor environmental quality, durability, and general cleanliness of PLEs.

Case Study

In 2018, the Ministry of Education of Peru (MINEDU) conducted a needs assessment of the WASH conditions in Peruvian schools to inform development of the National School Infrastructure Plan (PNIE) through 2025.[42] The WASH assessment built upon the results of the

2013 School Infrastructure Census (2013 CIE), which collected data on WASH conditions in schools across the country in addition to data on other basic conditions of indoor environmental quality and furnishings as well as the seismic vulnerability of school buildings. The WASH assessment included four phases: (i) definition of indicators; (ii) definition of legal standards; (iii) identification of intervention needs; and (iv) estimation of the WASH gap. Five categories of indicators were defined to collect more detailed data on WASH conditions within schools: (1) Access to water, sanitation, and hygiene; (2) Storage and pumping systems; (3) Suitability of restrooms; (4) Drinking water fountains; and (5) A rainwater drainage network. A review of national and other Latin American standards related to WASH was then conducted to better consolidate and characterize the minimum standards necessary for the WASH interventions. This included a review of policies related to decentralized infrastructure. Next, specific intervention needs were determined, considering different climate zones within the country, and finally, the cost of the necessary interventions was estimated to determine the total investment needed for WASH improvements. The process highlighted the need for improvements in inter- and multisectoral coordination, prioritization, and decision making.

B. Make PLEs physically resilient to protect health and physical safety and to minimize the disruption of education:

1. Awareness of climate change, natural hazards, and violent conflict should factor into the planning of school infrastructure by government authorities on a national or regional scale. This includes conducting climate and disaster risk screenings and ensuring, where possible, that new school sites are not located in current or future high-risk zones, or where exposure is unavoidable, taking appropriate measures to reduce the risk. It also includes prioritizing investments to enhance the physical safety and resilience of existing PLEs that are at high risk for damage due to natural or man-made hazard events.

2. Government agencies must also develop and enforce construction standards that protect the physical safety of students and staff and facilitate the reliable performance of PLEs in the face of natural or man-made disasters as well as slow-onset climate stresses such as drought, nuisance flooding, and heat. It is important to have these tools, in addition to established priorities and plans, in place in advance of disasters so that if reconstruction funds are available, they can be leveraged to advance improvements to school safety at scale.

3. Government EMIS should include data on the physical characteristics of existing school infrastructure that can be used to assess vulnerabilities to natural and man-made shocks and stresses and to plan risk-informed interventions.

4. The implementation of risk-informed approaches at a national or regional scale requires capacity building and awareness raising within the public and private sectors as well as the training of builders and design professionals on hazard-resistant approaches.

5. School communities can support risk reduction planning and climate adaptation by: (a) collecting and sharing information on the physical vulnerabilities of school sites and infrastructure; (b) organizing site-specific interventions such as the introduction of shade structures, reflective paint, drainage systems, or deployable flood barriers to reduce vulnerability; (c) ensuring that all emergency preparedness and response equipment (for example, smoke detectors and alarms, communication systems) are adequate, functional, and coordinated with preparedness plans, and that school communities are trained to understand how to respond in an emergency and the role that the physical environment plays. Similar school-based initiatives can also be used to protect PLEs from surrounding

violent conflict, for example through construction of perimeter walls, installation of security systems and guards, or introduction of early warning systems that trigger protective emergency response actions.

6. In cases where schools are used as emergency shelters for communities or serve other alternate functions during an emergency, government authorities in charge of emergency management should coordinate with local authorities and school administrators to ensure that emergency functions do not disrupt the delivery of education services and support education continuity.

7. In situations where temporary PLEs are necessary due to forced population migration or displacement, they should aim to achieve the qualities identified in this Note, including inclusivity, child-centeredness, and the provision of basic services including WASH. They should also be coordinated with the hybrid learning approaches mentioned in Strategy 3.

Case Study

In the Kyrgyz Republic, the Ministry of Education is implementing a US$75 million investment in the physical safety and resilience of schools through the Enhancing Resilience in Kyrgyzstan (ERIK) project with the support of the World Bank.[43] The project includes the retrofit and/or reconstruction of 40 schools to address identified seismic risk as well as improvements to the energy efficiency and WASH services of schools. The Kyrgyz Republic is a seismically active region of Central Asia. Approximately 70 percent of the 18,000 school buildings within its portfolio of approximately 4,000 schools are vulnerable to damage in a moderate or severe earthquake event, placing students and teachers at risk of death or injury daily. The government conducted a national survey of school buildings to collect information on physical characteristics and vulnerabilities and used these data to conduct a performance-based seismic risk assessment to objectively prioritize interventions on a national scale. The risk-based prioritization framework also optimized the value of the investment using a benefit-cost ratio of lives saved (through retrofits) per dollar spent. The project included collaboration between national engineering universities, the Ministry of Education and Science (MoE), and the Ministry of Emergency Situations (MoES). The project also delivered trainings to build the local technical capacity of the State Agency for Architecture, Construction, Housing and Communal Services (SAACCHS), MoE, MoES, and local universities on performance-based engineering and risk-based prioritization. During implementation of the project, a regulatory gap in the local seismic code was identified, and complementary special design criteria were introduced to ensure the quality of the seismic designs under the project and to improve the seismic performance of other new buildings in the country. The first 10 schools in the project are currently in the design phase and construction is expected to begin in 2023. Having invested in collecting data and assessing the seismic risk of school infrastructure on a national scale, the MoE can continue to finance additional interventions in a strategic, efficient, and equitable way with future access to capital.

C. Make PLEs sustainable to reduce negative environmental impacts and avoid exacerbating future climate and safety risks:

1. Government authorities must consider the long-term performance objectives and needs for facilities when planning new investments in school infrastructure at scale. This includes the need for physical resilience to climate change and natural disasters as well as durability and environmental sustainability. Flexibility to accommodate evolving programmatic

needs, as discussed below in Strategy 3, is also critical to ensuring PLEs are fit for purpose in the long term. Government authorities should also strive to achieve climate co-benefits in PLE investments, including the reduction of greenhouse gas emissions that contribute to climate change.

2. Government authorities in charge of the design and construction standards for PLEs should promote the use of locally appropriate, sustainable construction materials and energy and water efficiency, which have the added benefit of reducing long-term operational costs. The engagement of local communities in planning and implementation can facilitate sustainable solutions that can also enhance the indoor environmental quality of facilities. As important elements of public social infrastructure, PLEs should not only contribute meaningfully to national efforts toward climate change mitigation but also lead the way in demonstrating progressive and appropriate sustainability approaches for the rest of the built environment.

3. School communities can improve the sustainability of existing PLEs with local resources and efforts by introducing equipment and materials such as low-flow faucets, LED lights, solar panels, and rainwater capture systems. They can also foster behavioral changes (for example, turning off lights during the day, reducing water use) in conjunction with an educational curriculum on sustainability and climate change. The UNESCO Green Academies initiative empowers youth through participatory design to identify specific needs and co-create solutions related to four pillars (water security, clean energy, biomass production, and waste management), and to develop a plan with their teachers.[44,45]

4. School communities can also support "rewilding" and greening of schoolyards with adequate shade to create places for play and learning that support holistic development and have the added benefit of reducing the negative effects of climate change, including heat waves and flooding, and increasing green space for the surrounding community at large.[46,47,48]

Case Study

In Russia, where the government is implementing reforms to improve the supply and quality of early childhood education, it has been shown that new design standards for preschool facilities not only support more child-centered PLEs but also improve energy efficiency and reduce long-term operational expenditures on heating and electricity.[49] Traditional layouts for Russian preschools favor separate rooms and corridors that are spatially inefficient due to the "group isolation" principle of discouraging mixing of different classes. Most Russian schools also rely on outdated energy infrastructure and equipment. A pilot project of a new kindergarten facility in Beloyarski City demonstrates that the use of more open and flexible classroom layouts, including a multifunctional shared central space, reduces the total area required per student and corresponding energy usage and construction costs. These efficiencies, combined with additional energy efficiency gains in the heating and electrical system of the facility, demonstrate the potential for achieving energy and cost savings, in addition to more child-friendly PLEs, at scale by introducing similar design standards across the school infrastructure system. A separate study in Russia found a correlation between student test scores and the level of physical comfort in PLEs, including temperature, ventilation, acoustics, and smell, providing further evidence of the importance of sustainable features and indoor environmental quality on learning outcomes.[50]

Do You Want to Learn More About Building Resilient and Sustainable PLEs?

- Go to the World Bank's WASH in Educational Settings Toolkit for guidance and resources related to improving basic water and sanitation services in PLEs.
- Refer to the World Bank's Roadmap for Safer and Resilient Schools for step-by-step guidance on addressing natural hazard risk in school infrastructure at scale, and Pillar 1 of GADRRRES's (Global Alliance for Disaster Risk Reduction and Resilience in the Education Sector) Comprehensive School Safety Framework 2022–2030 on safer learning facilities.
- For additional evidence and guidance on improving the indoor environmental quality of PLEs, see Harvard's Schools for Health report.
- See the International Development Bank's (IDB) report on Environmentally Friendly School Infrastructure for more guidance on making PLEs greener and more sustainable.
- The INEE's (Interagency Network for Education in Emergencies) Education in Emergencies Toolkit and UNICEF's Education in Emergencies Resource Tool Kit provide guidance on the creation of temporary PLEs for displaced populations and on reconstruction of schools following emergencies.

3. FOSTER PEDAGOGY-ORIENTED PLEs

Foster pedagogy-oriented PLEs that support and enhance teaching and learning approaches. Pedagogy-oriented PLEs are those that are child-centered and aligned to pedagogical approaches and that provide adequate teaching and learning materials.

Why

PLE designs need to provide support to and enhance teacher and learning processes. PLEs have the potential to positively influence student engagement, teacher productivity, and learning climate, ultimately affecting learning outcomes.[51] Increasing the effectiveness of PLEs is not only about investing more but investing more wisely through better designs that prioritize simple design solutions with flexible spaces that allow for different arrangements and enable more collaborative behaviors.[52] Better PLE designs are those that ensure adequate alignment with the curriculum, are centered on students' needs, and are adaptable to accommodate current pedagogies as well as evolving ones (for example, teamwork, green school curriculum). Education resources are also critical. As shown in the analysis of 2018 Programme for International Student Assessment (PISA) results,[53] the educational resources available in a school tend to be related to the education system's overall performance as well as to the schools' average level of performance. Furthermore, high-performing systems tend to allocate resources more equitably between socioeconomically advantaged and disadvantaged schools.

How

A. Create child-centered PLEs that promote learning through naturalness, individuality, and stimulation:

1. Government authorities in charge of school design and construction standards, in addition to requiring basic service provision and health standards, should take a step further to promote learning by enhancing naturalness, individualization, and appropriate stimulation.[54] Naturalness includes factors such as the amount of natural light, the quality of air and acoustics, and access to green space in PLEs. Individuality is a measurement of how much flexibility is integrated into the design of PLEs (for example, in model school designs) to allow for community and individual customization, expression, and ownership. Stimulation refers to the appropriate amount of visual complexity and color in PLEs. Together these characteristics of PLEs have been shown to promote learning.
2. School communities can improve the naturalness, individuality, and stimulation of PLEs at a local scale by using furniture, furnishings, and finishes to customize and enhance existing classrooms, corridors, and play areas to reflect community interests, preferences, and values and to improve visual stimulation through colorful murals and artwork.

Case Study

For example, in Bengaluru, India, the Kunskapsskolan School is a primary and secondary school that is part of a global network of private Swedish schools specializing in child-centered, personalized education.[55] In this school, the architecture of the buildings is used as a tool to facilitate learning. The design of physical spaces is intended to align with the school's culture

of openness, collaboration, and personalization. Glass partitions are used to separate learning spaces while allowing light to pass through and providing a sense of security. Wide corridors function as multipurpose work and collaboration spaces and facilitate flow between learning activities. Specialized areas cater to students with different learning abilities to promote hands-on learning and personalized and inclusive activities. The school also includes a dance studio, art studio, music room, and makerspace/robotics lab. The design of the PLE gives students more ownership over where and how they work individually and collaboratively, helping to prepare them for similar environments in higher education and adult work life.

B. Design PLEs to adapt to evolving pedagogies and support diverse types of learning:

1. Government authorities should develop design and construction standards for new schools that allow for the adaptation of PLEs over time. As teaching methodologies evolve and there is greater recognition and acceptance of the diversity of effective learning approaches, PLEs must also adapt. While traditional school layouts and classroom configurations may still be relevant to current teaching practices in many places, new school infrastructure investments must be forward-looking and appropriate for their entire useful life. For example, classrooms may include moveable wall partitions to allow for changes in size and configuration, allowing spaces to be combined or separated off. The programming and spatial design of PLEs should also foster connectivity across different types of learning spaces, such as classrooms, collaborative workspaces, outdoor learning facilities, and libraries.

2. In situations where it is not spatially feasible or it is cost-prohibitive to accommodate specialized classrooms such as science laboratories, alternatives such as the use of multipurpose rooms in conjunction with science kits and ICT devices should be considered. This approach has been used in Zimbabwe successfully since the 1980s.[56]

3. School communities can pilot new approaches in individual classrooms in an incremental way, for example, by adjusting desks to promote group work or by partitioning off spaces for different classroom activities. These types of small-scale pilots, in combination with teacher training, can promote the effective evolution of PLEs in step with teaching approaches in a low-stakes way.

Case Study

A study in Russia[57] utilized the OECD's School User Survey[58] to better understand teacher and student usage and perceptions of PLEs as well as the relationship between characteristics of PLEs and student performance. The OECD survey was taken by more than 1,500 students, 160 teachers, and 32 school principals, most of whom were working within schools with traditional-style classrooms. It showed that most teachers are not in the habit of rearranging furniture within classrooms to facilitate alternate teaching and learning styles, even though they admit that doing so is relatively straightforward and easy. It also showed that teachers and students infrequently use nonclassroom facilities, including outdoor spaces, for learning purposes. These findings highlight the need to ensure that new approaches to the spatial design and configuration of PLEs are implemented in conjunction with behavioral changes and training of teachers and students who use the spaces. A more recent study of the OECD and 2019 TIMSS (Trends in International Mathematics and Science Study) data found strong linkages between

the design of PLEs and student learning outcomes, including the influence of the configuration of PLEs on teaching and learning practices that support the development of critical 21st century skills.[59] These findings reinforce the importance of rethinking the architectural design of school infrastructure to better align with a 21st century context when governments invest in the construction of new school facilities.

C. Provide adequate learning materials, including ICT for blended education modalities:

1. Education systems need to ensure that schools have sufficient, adequate, and high-quality learning materials. These materials refer to basic provisions (such as pencils, markers, and paper), teaching materials and books, and toys for early childhood education, as well as furniture and technology equipment. Government officials need to ensure an equitable distribution of learning materials, focusing on those schools serving the most disadvantaged populations.

2. COVID-19 demonstrated that it is critical for PLEs to have appropriate ICT infrastructure and contingency plans to allow for blended education modalities to ensure learning continuity during disruptions to in-person learning. In some contexts, this may include access to laptops and mobile phones; in others, it may include radio or TV programming in addition to distributed learning materials. COVID-19 also highlighted the importance of ensuring inclusive approaches to remote learning, including providing TLMs in multiple formats and languages and addressing specific needs of learners with visual and hearing impairment and those with other types of disabilities.[60]

3. The school community must also guarantee access to TLMs to those students who need it the most and ensure the materials are of high quality and properly used. What matters for student achievement and other educational outcomes is not necessarily the availability of resources but the quality of those resources and how effectively they are used.[61]

Case Study

In Uruguay, "*Plan Ceibal*" was key to ensure education continuity during the school closures caused by COVID-19 because students already had access to remote learning through digital technologies. *Plan Ceibal* is a digital technology center that promotes the integration of technology to improve learning and foster processes of innovation, inclusion, and personal growth. *Plan Ceibal* also provides access to digital platforms of adaptive learning to teach math and language to more than 50 percent of students nationwide. *Plan Ceibal* contributed to reducing the computer access gap between the highest and lowest income quintiles, establishing an equity scenario. Thanks to *Plan Ceibal*, in 2021 99.8 percent of students in Uruguay (789,000) had Internet access and connectivity; 100 percent of schools (3,023) had a WiFi connection; and 50 percent of schools had a videoconference room.

Do You Want to Learn More About Building Pedagogy-Oriented PLEs?

- The following resources provide additional evidence related to the connection between PLEs and teaching and learning outcomes as well as guidance on improving PLEs to support educational outcomes:
- The World Bank's The Impact of School Infrastructure on Learning
- Council of Europe Development Bank Constructing Education: An Opportunity Not to be Missed
- Harvard's Schools for Health report, included under Strategy 2

Conclusion

A safe, inclusive, and positive learning environment is critical to ensure student learning, health and well-being, and relationships (with peers, teachers, family, or in school). Some students also may find school to be a refuge and an escape from unsafe home environments. PLEs can influence school safety levels and how students and teachers engage in the teaching and learning process. The evidence clearly indicates that education systems and schools that provide access to and promote inclusive, sustainable, and physically resilient PLEs for all students and teachers are better able to protect their schools, respond, and recover from disruptions to education. Moreover, fostering pedagogy-oriented PLEs can further promote and improve school safety levels.

The three strategies proposed in this Note identify key approaches to strengthen the role of PLE practices with the intention of focusing on actionable strategies that can be applied in low and high resource settings. As highlighted, different students may require different types of support to feel/be safe and the same should be considered while prioritizing strategies. Moreover, these three strategies form part of the guidance on safe school practices and can be integrated with strategies that strengthen management and T&L practices, depending on context and needs.

Endnotes

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[13] The accompanying *Approach Note: Global Guidance for Supporting and Sustaining Safe Schools* provides details on understanding the local *context* by diagnosing school safety risks. The AN also lays out the factors that influence school safety and the negative impacts of those factors on safe school outcomes.

[14] Diagnosing the inherent shortcomings of existing PLEs related to safety is only the first step in a gradual and continual process of creating safer PLEs. The evolution of the built environment is a slow, progressive process. Existing inventories of school infrastructure in LMICs have taken many decades to build and will be gradually replaced over many decades. These improvements must be made strategically by leveraging: (1) regular investments in new school construction; (2) ongoing maintenance and rehabilitation activities in existing schools; and (3) reconstruction following a disaster. They must be supported by interventions at both national and/or regional levels and community and/or school levels as well as enhancements to the enabling environment including policies, regulations, and capacity building. The success of these interventions relies upon access to timely and reliable data; clearly defined responsibilities and coordinated planning mechanisms for effective planning and delivery; and adequate funding.

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