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**UNESCO**

## **PAMUN XVII RESEARCH REPORT—**

### **Question of infrastructure and its contribution to education**

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#### **Introduction of Topic**

Education is one of the fundamental system in our society. Education allows generations of people to improve upon the previous to strive for social, economic, political, and scientific progress. Despite living in the most educationally advanced time in human history, our educational infrastructure is still flawed on many levels.

Many communities struggle finding the resources to establish a conventional education system for children. Today, more than 72 million children eligible for primary education are not in school and more than half of these children live in sub-Saharan Africa and often in conflict-affected areas. Additionally 103 million youth worldwide are illiterate. These numbers stem from the fact that education is still a very inaccessible right worldwide. One of the causes of a lack of education is a lack of quality educational infrastructure of Schools, transportation, and staff. Many emerging economies lack the financial resources to build schools and provide schooling. While international humanitarian aid is the highest in history, only 2.7% of those funds go to education and while it is not enough, the percentage is decreasing every year. The world already lacks enough teachers and it is estimated we will need almost 69 million more teachers to reach goal 4 of the United Nations Sustainable Development goals.

It is time to reassess the methods we have approached this problem, by modernizing our current actions and seeking new mediums of teaching to ensure our future generation's well-being.

#### **Definition of Key Terms**

##### **Educational Infrastructure**

Infrastructure includes the physical and organizational structures needed for the operation of a society or enterprise. In terms of educational infrastructure, this can be defined as any structures that enable access to quality education. The obvious include school and university buildings but other examples can include teacher training, satellites providing internet access, examinations, curricula or curriculum, frameworks, teacher education, inspection systems, etc

##### **Challenging Geographies**

Challenging physical geographies may include mountainous areas, steep hillsides, deltas and river basins, deserts and islands, volcanic and tectonic zones, and various other environments. Many countries have challenging geographies which may be conceived of as barriers to education. This may be due, for instance, to long treks to school taking up to 2 to 3 hours just to go to and from school on a daily basis. Such paths are not only time consuming but dangerous for children. Different countries have handled these environments differently however. For example, the Netherlands has 27% of its land below sea level. However, 60% of the country's population (16 million) lives in these regions and flooding is rare. In a different scenario, half of the land in Bangladesh is near sea level but is still very susceptible to regular flooding from the Ganges River or by typhoons.

## **Background Information**

### **Where We Are and What Are Our Goals**

The United Nations International Children's Emergency Fund established certain children's rights in the United Nations Convention on the Rights of the Child (CRC or UNCRC). This convention was signed and ratified by all 196 members of the United Nations except for the United States of America who has signed but not ratified the convention. This is due to some political group claiming the convention conflicts with the United States Constitution and a difficult treaty ratification process. Article 28 of this convention titled "the Right to education" states that all children have the right to a primary education, which should be free. The Convention places a high value on education. Young people should be encouraged to reach the highest level of education of which they are capable." This article is also accompanied by Article 29 that discusses the goals of education. Similar principles can be found in the United Nations sustainable development goals which includes goal 4: Ensuring inclusive and quality education for all and promote lifelong learning by 2030. The point being that in order to meet these goals set out by the United Nations, one of the challenges we face is providing the necessary infrastructure to create suitable spaces to learn. At the rate at which the education sector is growing, growing problems like population to teacher ratio, classroom space, and accessibility to basic facilities will become more severe as time passes.

### **The Relationship Between Quality Infrastructure and Quality Education**

The quality of educational infrastructure is directly related to quality education. This means that the main consequence of a lack of this quality infrastructure is a poor quality of education. This makes quality infrastructure important in order to reach goal 4 of the United Nations Sustainable Development Goals.

## Conditions of Quality Educational Infrastructure

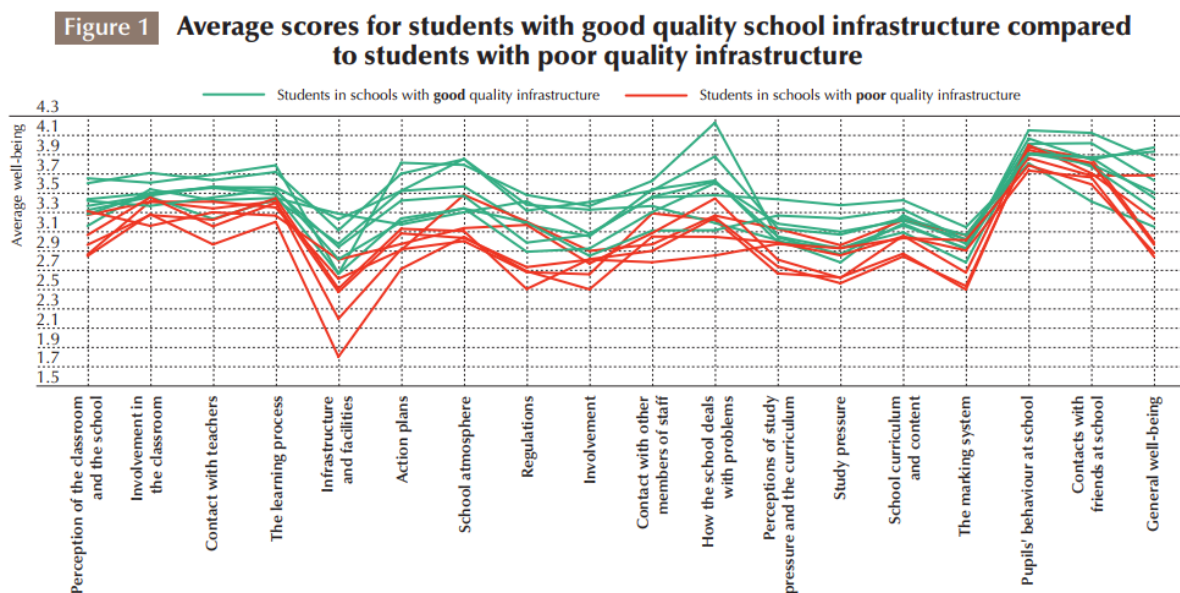
Quality educational infrastructure can provide spacious rooms that leave good learning conditions for students to yield promising results. A quality infrastructure reaches out to all children, irrespective of gender, sex, religion, or orientation and attracts an interest in learning. It also provides comfort for students, teachers, and administrators—temperature, ventilation, water, includes facilities for rehearsals and practices—libraries and labs, and spaces for talent to develop—sports, entertainment, and culture.

## Consequences of the Lack of Educational Infrastructure

In 2010, the 21<sup>st</sup> Century School Fund in the U.S. initiated a study that found statistically significant positive results when observing the relationship between a quality school infrastructure and standardized tests. The positive effects were even more effective in student populations with relatively lower socio-economic levels.

Oppositely, poor school infrastructure can act as a barrier to quality education. Factors like inadequate sanitary facilities, water scarcity, and enrollment capacity can lead to less children having access to education. This effect is significant among girls who are often prioritized to be forced out of school due to a lack of resources and to cultural values emphasizing differences between the genders.

Figure 1.1 Is from a study which found a correlation between the quality of infrastructure and the wellbeing of students.



**Figure 1.1 a graph comparing the average well being of student in certain aspect of quality infrastructure. Green and red lines represent how good/poor quality infrastructure schools fared.**

## Major Countries and Organizations Involved

### United Nations International Children’s Emergency Fund (UNICEF)

UNICEF, established on the 11<sup>th</sup> December, 1946, is an organization focused on providing humanitarian and development aid to children in developing countries. They have established and protected many children’s rights in underprivileged areas by launching funding campaigns, awareness projects, and direct action in afflicted regions.

### Organization for Economic Co-operation and Development (OECD)

The OECD is an organization of 35 countries that aim to promote policies that improve the economic and social well-being of people around the world. Every year, OECD members contributed about 5% of their gross national product to education. The organization also runs a Program on Educational Building (PEB) that provides guidelines when building schools. Lastly, the organization also is involved in the assessment of schools and data monitoring of the sector.

## Timeline of Events

Date	Description of event
20 November 1989	Convention on the Rights of the Child signed
October 2014	Worldwide Initiative for Safe Schools established
14 December 1960	UNESCO Convention against Discrimination in Education

## Relevant UN Treaties and Events

- The Convention on the Rights of the Child (CRC)
- Transforming our world: the 2030 Agenda for Sustainable Development (A/RES/70/1)
- The right to education (A/HRC/32/L.33)

## Main Issues

### Transportation

While in many developed nations, plentiful public schools and transportation allows an efficient school day lasting usually 7 hours. However, in many developing countries, it is very different. Because

of a lack of schools, many children have to traverse multiple miles to get to their schools causing children leaving very early in the morning and return very late. Sometimes these pathways can be dangerous mountain cliffs, aged and crooked bridges, or across plains of wild lands. These dangerous pathways can be described as challenging geographies (defined in key words section). A lack of roads, bridges, and crossing mechanism leads to other kinds of dangerous pathways. In South Africa, some children have to unsafely cross a road to avoid a longer more dangerous path. The country has on average three children under 15 die on the roads daily. This issue's relevance is accentuated because the stress from the dangerous paths to school have been reported to effect a student's ability to learn thus infringing on article 29, goal 4 of the CRC: Ensuring inclusive and quality education for all and promote lifelong learning by 2030. Vehicle transportation for student transport can also be lacking in some regions. School specific "yellow buses" are mostly regular only in North America while other regions use general-purpose buses. Regions that lack public transport like trains and buses resort to other methods. An example can be seen in Thailand: about 1.3 million children ride on the back of their parent's motorcycles to school but only around 7% wear helmets. Subsequently, crashes leads to 2,600 children being killed and 72,000 injured every year. This challenge must be met with development of safe and affordable methods of transportation.

## Educational facilities

### *Building Schools and Higher Education*

Another facet of the previously mentioned issue of transportation is to build more schools. A Lack of schools not only leads to the issue of transportation along great distances to school but also cluttered classrooms in the existing ones. The recommended amount of children per classroom varies by institution but national averages can vary from 10 children per classroom to 36 children per classroom. Because of overcrowded classrooms, the teacher of the classroom can't tend to each students talents and needs thus leading to a decrease in quality of education. The obvious solution to this is to build more schools or classrooms but estimates show that the world's least developed countries needed about four million new classrooms from 2014 to 2015, a goal that is very difficult to achieve. Upon building schools, higher education facilities like universities lack in some regions. The problem that is very important regarding higher education is brain-drain: a trend that shows highly skilled individuals leaving their country to work for the economy of other countries. This is a problem because a country may contributed so many resources towards higher education but the product, an educated individual, may leave the country to work for some foreign company. This is because workers may find better working conditions or pay wages. Some argue that this economic effect will help the country in the long run because a competent individual will be able to develop more in the abroad country and in the long term these developments will help the origin country. However it is hard to predict the future of such an effect and the results of it will happen in the long term and not affect the foreseeable future.

### ***Sanitary and Support Facilities***

Schools as a safe space also need provide for their students. This means developing their facilities to allow for clean sanitation and age appropriate bathrooms. This right to children is also accompanied by their right to access clean water. Infrastructure like fences and services like enforcement should also be implemented to protect students from outside predators or any man with malicious intent. Medical facilities in schools are also in some cases a big concern. For developing countries that are struggling with malaria and even simpler things like the common cold, a school space is prone to spreading such viruses and should be confronted with capable medical facilities and protocols. Other facilities that schools lack include psychosocial support, early child care and mother support, disability support (from birth, ill health, malnutrition, or conflict), and play areas. These children's rights must be respected by school but are unfortunately not in many communities. Another problem today's children face is high cost and inaccessibility to higher education, calling for an increase in scholarships available to developing countries. Many of these facilities can be applied to Universities and Colleges that lack the proper resources to provide for their students.

### ***Technologies and Energy***

Some people believe that the introduction of technology can increase the quality and capability of education through an "information highway". However, it is still not clearly established that technological tools bring tangible benefits to all students. Educational technologies refer to computers and Internet access through satellites. In developing nations, computers are a very expensive tool for many schools. This calls for possible charity foundations that can provide computers for educational purposes or the development for cheaper computers or technological alternatives. The same goes for satellites. Internet access is an expensive development especially when making it available to rural places. On top of these physical infrastructures, a student must learn how to benefit from these technologies. It seems that the technology has so far only helped groups of students with technical knowledge and educators oriented towards technology. The benefits are distributed unequally and underprivileged students do not receive these educational resources. This is a development that is needed to be refined before further progress is to be made.

### **School Faculty and Management**

Additionally, many schools in the world are not safe for children. It is estimated that 50% of children that die in earth quakes die within a school. Other structural dangers that educational infrastructures face are floods, fire and arson, landslides, wind, building deterioration, neighboring property risks, terrorism, and security. Methods of prevention are inexpensive and simple to implement in classrooms yet are somehow not popularized.

Teachers and other school management are the drivers of education. Further efforts must be made to improve teachers and their teaching methods. It is estimated that 69 million schoolteachers are required to provide every child with primary and secondary education by 2030. Other issues exist in the training of teachers. Firstly, many teachers aren't trained to use classroom technology. Integration of technology in schools has a potential of being very useful to the quality of education but a limiting factor is the teacher's attitudes and skills on technology. Some also argue that we need a more balanced gender gap in the sector. For example, A National Education Association report stated that on average, the 50 U.S. states had 25% of their teacher population being male. Lastly, the problem can be rooted in the need for education colleges for education majors. The institutions where teachers are trained also need to be bolstered to increase the amount and quality of teachers in the world.

### **Slow return investment**

Investors tend to think about short-term goals and quarterly returns. This type of thinking works against the education sector, which requires long term commitment and willingness to wait for results to emerge: improvements in the education sector today will yield results only when students are grown into adults. This means that there is a whole generational gap between the investment and the return causing a difficulty in developing the sector.

### **Decentralization or Recentralization of Schools**

Different schools in the world hold different levels of autonomy. This varies depending on the country's School Construction Authority (SCA). Many countries hold local SCAs in each school district or have hierarchal SCAs with one general SCA on top. In other words, some schools may be governed by national governments while others operate under sub-national governments. There are pros and cons for each route. For example, sub-national governments may know local schools situation, resource availability and can decide on more unique policies and programs that better suit the student's preferences. However, a national government may make decisions that are more favorable to the nation as a whole, counting in externalities and spillovers to national goals. Instead of choosing a side, another possible solution is to make a mix of the two. Some aspects of infrastructure may fall under national or sub-national governments. School design, which concerns safety, equity, and efficiency of the building is some that that needs to be controlled and equal to give fair opportunities. This means it would work best with a central government. The same would be for a schools location. The planning of where to develop schools will concern maximizing national enrollment goals which requires a body with a wide perspective. Conversely, aspects like school staffing and student allocation are investments done on an as need basis that work uniquely with a certain school.

### **Previous Attempts to solve the Issue**



## Organizations

The Educate a Child (EAC) and UNICEF program have launched programs bringing quality basic education to children around the globe. One of which efforts includes working in Chad, Comoros, the Democratic Republic of Congo, Kenya, Nigeria, Somalia, South Sudan, Sudan, and Yemen to bring 3.3 million children the educational infrastructure they need. There are also EAC partners like the Gonoshahajjo Sangstha (GSS) system in Bangladesh that is improving 575 schools for 100,000 children's primary education. In Sudan, UNICEF has improved sanitary facilities—especially for girls—in an effort to tackle some of the barriers that 240,000 children in Sudan face. Other NGOs have also sparked up. For example: The Room to Read program builds literacy in Africa and Asia by providing educational material in local languages.

## Health and Disability Improvements.

School-based health centers is more common in the westernized world than in the rest of the world. For example, New York initiated the first U.S. school health program in 1894 and their numbers of centers within schools have exponentially risen since. The United States has also introduced infrastructure to provide aid to children with disabilities through the Equality Act of 2010. Such infrastructure improvements include access to ramps or elevators, labelling of rooms with Morse code, staff designated to aid disabled children, and other special needs. On a more global scale, the UNESCO Convention against Discrimination in Education (1960) prohibits any exclusion from educational opportunities on the basis of perceived differences. Such include sex, ethnic/social origin, language, religion, nationality, economic condition, and most importantly, ability. This was reflected in the UN convention on the Rights of Persons with Disabilities

## Better School Construction

The World Wide Initiative for Safe Schools is a partnership led by national governments whose goal is to develop and implement safe learning facilities (disaster proof), disaster management, and disaster risk reduction and resilience education. These are combined to create safe schools around the world. This initiative is promoted by the Global Alliance for Disaster Risk Reduction and Resilience in the Education Sector (GADRRRES), a mechanism involving 10 difference UN agencies, international organizations, and global networks.

The PEB organizing Framework is a Working Group on Evaluating Quality in Educational Facilities. The five principles they test include whether the facility is fit for purpose to the users' needs, is fit for purpose to the operational layout, is visually pleasing and educational, provides a healthy and safe environment, and is environmentally sustainable. Through indicators and benchmarks, the program has been able to assess school quality among OECD members.

## Bringing Internet and Technology



Avanti, the leading communications group in Europe, Middle East, and Africa, has taken a 10.7 Million euro initiative to bring broadband Wi-Fi hotspots to underprivileged schools in Sub-Saharan Africa in 2017. This is possible through their technology: ECO satellites that can provide connectivity at lower costs around \$3 per month on average. UNESCO has also taken approaches to implementing Information and Communication technology in education. The organization's global reach lets it help construct education policies, strategies, and activities with these Information and Communication Technology.

## Possible Solutions

### Guidance on Safer School Construction

International humanitarian aid and governmental efforts can be realigned with current tools available for safer construction of schools. Such changes would lead to schools being built with further structural integrity and common protocols and procedures to follow in order to combat natural disasters. Some tools include "Towards Safer School Construction: A community-based approach by the Global Facility for Disaster Reduction and Recovery, "the INEE Minimum Standards for Education: Preparedness, Response, Recovery" by the Inter-Agency Network for Education in Emergencies, and Plan International's report on "how Safe Schools Global Programme engages education sector partners. These are aimed to provide framework to a rebuilding of policies. These standard should be respected and built upon so that we can expand the number of schools while assuring quality of education.

### Monitoring Progress

To ensure expectations are met with delivery, certain targets and indicative data should be transparent and available. This means assessing regional areas on their educational performance and standards. This can be done through a refocus of priorities and resources and cooperation among international agencies. The methodology of indicators shows a solution. Some indicators of use in the assessment of educational infrastructure include: the school has a spatial structure and is easy to orient to, the classroom is open to a "green" outside area, the school efficiently provides information communication technologies (ICT) and other sources for research, safety indicators like protection against break-ins, condition of the buildings, the amenity and physical comfort of the building which means providing an appropriate temperature, acoustics, lighting, and ventilation. These indicators of quality infrastructure can be compared to the average wellbeing (using various measurement techniques) to assess how the infrastructural development affects the sector.

### Creating Transportation

To ensure an easy school schedule for a child, we must ensure the path they take to school are safe and timely. Because every path to school is different, there are many possibilities we can tackle this

issue. Some would include building roads and bridges, providing bus, train, or bike transport, and a means of protecting children from men with malicious intent. Of course the challenge would be organizing these efforts into a simple and effective plan of action that would be able to detect areas of need and allocate resources.

## Management and Facilities

The quality of education can be enhanced through the constituents of a school system. The teaching force can be bolstered through heightened standards of teaching, wages, and intensity of teaching training programs.

Similar to the creation of transport, a multitude of facilities and functions of a school can be refined and or introduced through many different methods. Such facilities include: sanitation, age and gender appropriate bathrooms, clean water, protective barriers, medical facilities, child care, mother support, disability support, and play areas. We must devise a plan that places these functions in an order of priority for example medical facilities being very important and play areas being less important, to ensure efficient resource allocation. Again, similarly to transportation, the challenge would be organizing these efforts into a simple and effective plan of action.

On the government end of the spectrum, a decision must be made towards finding a centralized or decentralized education. Instruments available to decentralize a school includes: devolution to local governments, an instance where local governments closely monitor, promote through local labor, and integrate municipal investment to local school districts. Community based approaches, which take many forms, have worked in contexts like Mauritania, Malawi, Mali, India, Uganda, and Mexico. Ties to NGOs can build cheaper schools which are not binding to national requirements for facilities like CARE schools in Egypt. Delegation to Contract Management Agencies (CMAs) or Public Private Partnerships (PPPs) can promote small contractors with local labor. These tools can compare to current methods of centralized schools to see which school system is best.

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## Appendices

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