Evaluating the State and Performance of Schools in the UAE

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Course Description

**EVALUATING THE STATE AND PERFORMANCE OF SCHOOLS IN THE UAE**

A. Importance
1. What is a Green School?
2. Why are Green Schools important?

B. State
4. Why evaluate?
5. Coalition for Green Schools

C. Performance
6. Benchmarking
7. Building Efficiency Accelerator
8. Methodology
Jason John

*Technical Analyst, Emirates Green Building Council*

Jason John is a Technical Analyst with Emirates Green Building Council (EmiratesGBC) where he has helped carry out key projects related to Energy and Water Benchmarking of UAE buildings, Nearly and Net Zero Energy Buildings as well as led technical aspects of the Annual MENA Green Building Awards and the Emirates Coalition for Green Schools.

An award winning Material Science Masters graduate from Queen Mary University of London, Jason received the Best Materials Student Award and the International Science and Excellence Award for all years of completed study.

Prior to joining EmiratesGBC, Jason worked on two cutting edge research projects that were aimed at sustainability: Energy Harvesting using piezoelectrics and Water Splitting using Solar thin films. As such, he has a keen understanding of the needs to improve the global energy demands through active practical research.
Learning Objectives

1. Why are Green Schools Important?
2. What is the Current State of Schools in the UAE
3. How do we measure the Performance of Schools?
About EmiratesGBC

EmiratesGBC was formed in 2006, with the goal of advancing green building principles for protecting the environment and ensuring sustainability in the UAE.

Our Vision

For the UAE to be a global leader for sustainability in the built environment.

Our Mission

EmiratesGBC is a catalyst for collaboration and a hub for excellence to promote sustainability of the built environment in the UAE.
Importance of Green Schools
1. **Indoor Air Quality & Ventilation**

   Every 100 parts per million increase in CO₂ was associated with a roughly one-half day per year reduction in school attendance.

2. **Daylighting & Lighting**

   Students in the US showed a 36% increase in oral reading fluency when exposed to high-intensity light, while those in standard lighting conditions increased by only 16%.

3. **Thermal Comfort**

   Students sitting in a classroom as comfortable achieved 4% more correct answers in a math test compared to those who were hot.

4. **Noise & Acoustics**

   Noise can hurt test scores: for every 10 decibel increase in noise, the language and math scores of French students decreased by 5.5 points.

Source: Better Places for People – Green & Healthy Schools
Differences in Children

- Children differ from adults both anatomically, physiologically, cognitively and psychologically

Source: Royal Children’s Hospital Melbourne
• Children breathe more air in proportion to their bodies than adults

• According to the Centers for Disease Control and Prevention (CDC), asthma is one of the leading causes of school absenteeism in the US.

• Multiple studies have found that children’s overall performance decreases with illnesses or absences from school.

Source: EEA Signals 2013 – Every breath we take – Improving air quality in Europe
**Thermal Comfort Effects**

**Children are more sensitive to higher temperatures**

than adults because of their higher core body temperature and less developed thermoregulation capabilities.

**Higher humidity increased the rate of**

Sick Building Syndrome symptoms in a study of over 1,000 Polish students.

**Respiratory complaints**

were associated with “too hot” or “too cold” classrooms in a 2016 study of over 4,000 Finnish students.

*Source: Better Places for People – Green & Healthy Schools*
**Lighting Effects**

**Children have higher sensitivity to light**
because they have smaller pupils and less melatonin-suppression than adults, affecting their sleep/wake cycles and circadian rhythm.

**Daylight exposure in children**
has been associated with reduced low-activity time and increased weekend physical activity.

**Blue spectrum LED light**
in the morning could make children more stimulated and alert at school compared to those exposed to dim light.

*Source: Better Places for People – Green & Healthy Schools*
State of UAE Schools
- Total number of public schools – 659
- Total number of private schools – 657

Source: State of Our Schools White Paper
Coalition for Green Schools

Aims to ensure that every child in the UAE learns in a green school within this generation
Definition:
A green school provides a healthy environment for occupants, conducive to learning while optimizing environmental performance and encouraging environmental literacy.

A key outcome from the State of Our Schools roundtable was the collective agreement that a very limited number of schools, if any, fulfill the definition of a green school in the UAE.
Performance of Schools
Source: Energy consumption in schools – A review paper; Implementing the Energy Performance of Building Directive (EPBD); Field study on the energy consumption of school buildings in Luxembourg; Technical Reference Score for K-12 Schools in the United States
The Building Efficiency Accelerator (BEA) is an initiative led by World Resources Institute (WRI) under the UN program Sustainable Energy for All (SE4ALL) to double Energy Efficiency by 2030.

Dubai is the first and only city in the Middle East to sign as a BEA city. EmiratesGBC is supporting these efforts by serving as the City Liaison to the program in partnership with Dubai Supreme Council of Energy (DSCE).
### Energy Forms
- **Electric**: (Utility, Cooling, Lighting, Misc., Other)
- **Thermal**: (DCP CHW)
- **Fuel**: (LPG, SNG, Diesel)

### Influencing Factors
- **Qualitative**: (Age, Type, Characteristics...)
- **Quantitative**: (Area, Quantities, Other...)

### KPIs
- kWh/m², kWh/student
PROCESS

Literature → Questionnaire → Analysis → Reporting
Thank you