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THE WORLD CONFERENCEON EDUCATIONAL ENVIRONMENTS

HOSTED BY CEFPI INTERNATIONAL CONFERENCE & EXPO

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Presenters:

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www.adec.ac.ae/English/Pages/default.aspx

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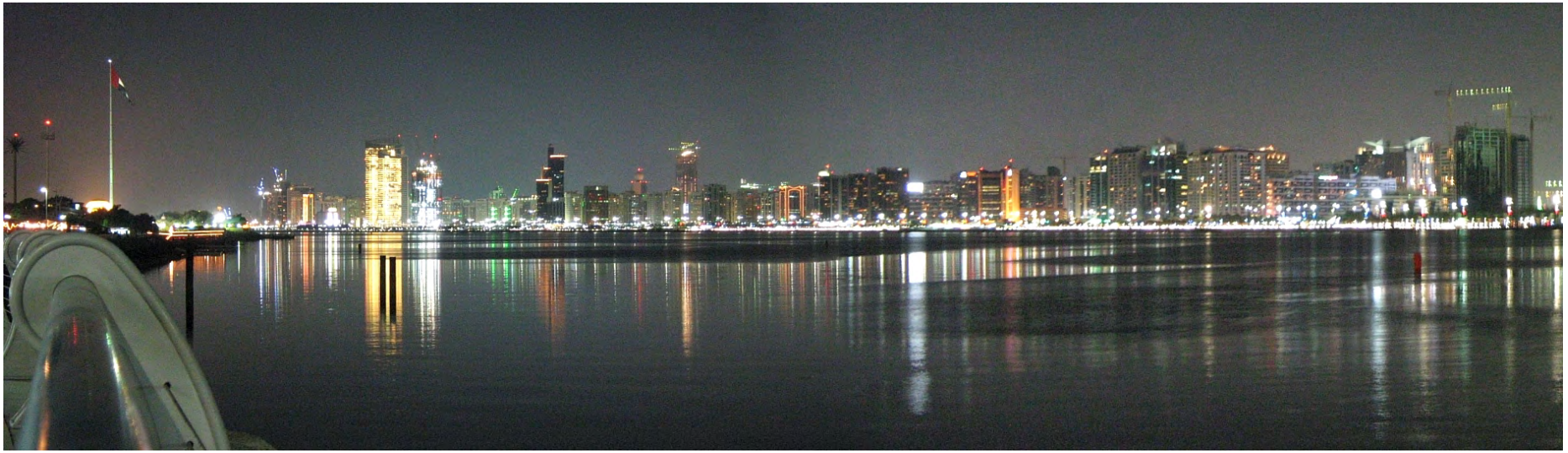
Context of the Work:

Abu Dhabi
United Arab Emirates



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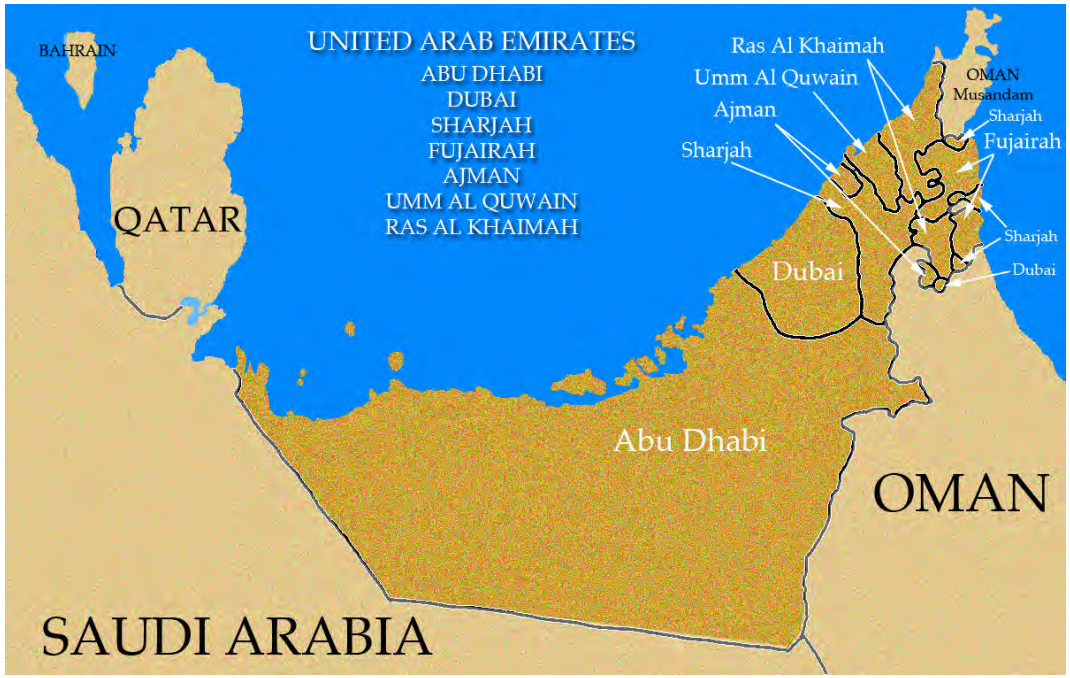
UAE Population	8,200,000
UAE Nationals	1,000,000
Area	73,300 km2 21,283 mi2
Urban population	85%
Public schools	268

Achievements since 2009

Phase I	**18 CI, CII & III**	**Deliver 2011/ 12**
Phase II	**5 KGs** **5 KGs**	**Deliver 2011** **Construction started 2012**
Phase III	**15 CI, CII & CIII**	**Awarded construction**
Phase IV	**10 CI, CII & CIII**	**Design started 2012**



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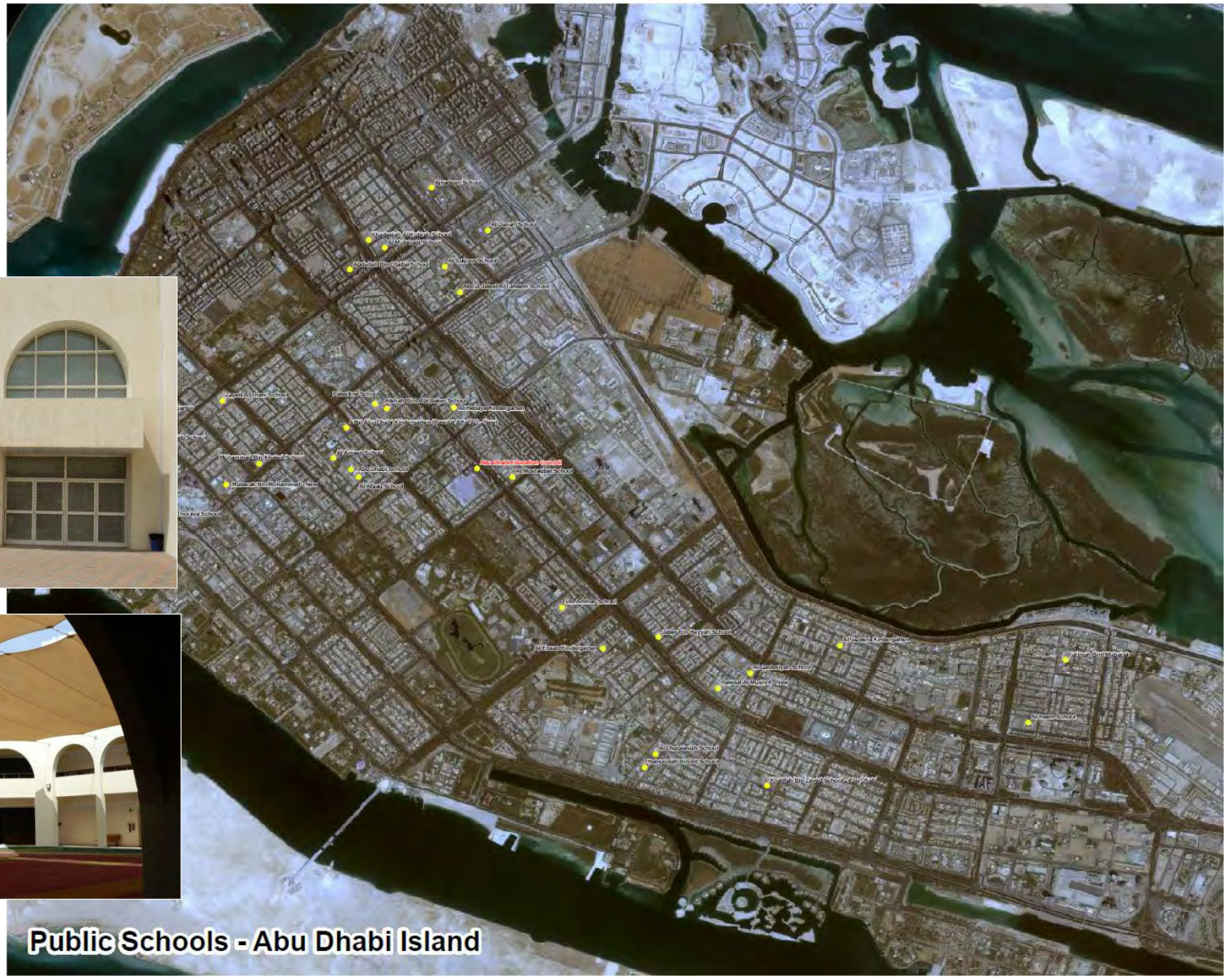

Public Schools - Abu Dhabi Island

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Public Schools Al Gharbia (Western Region)

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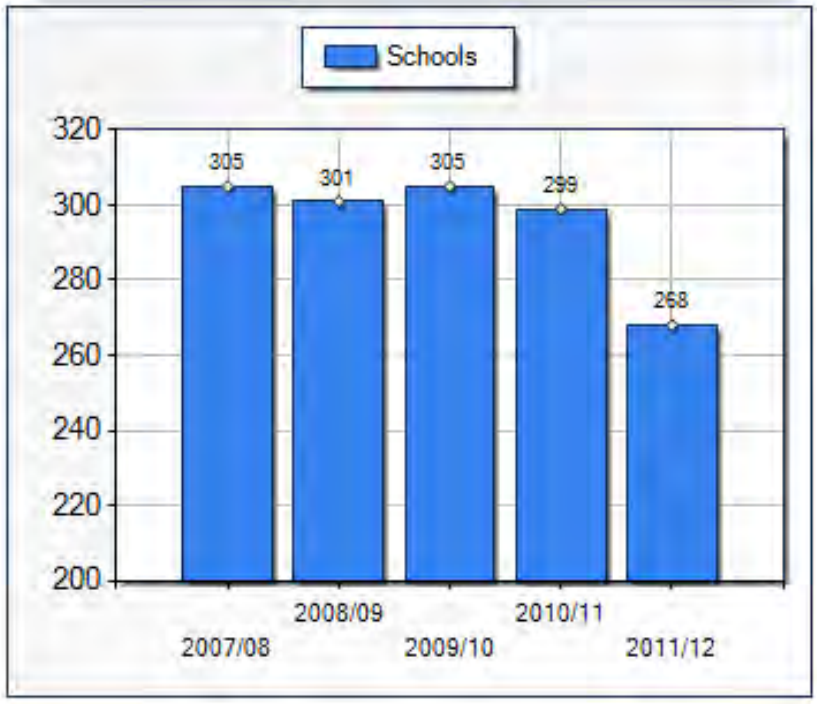
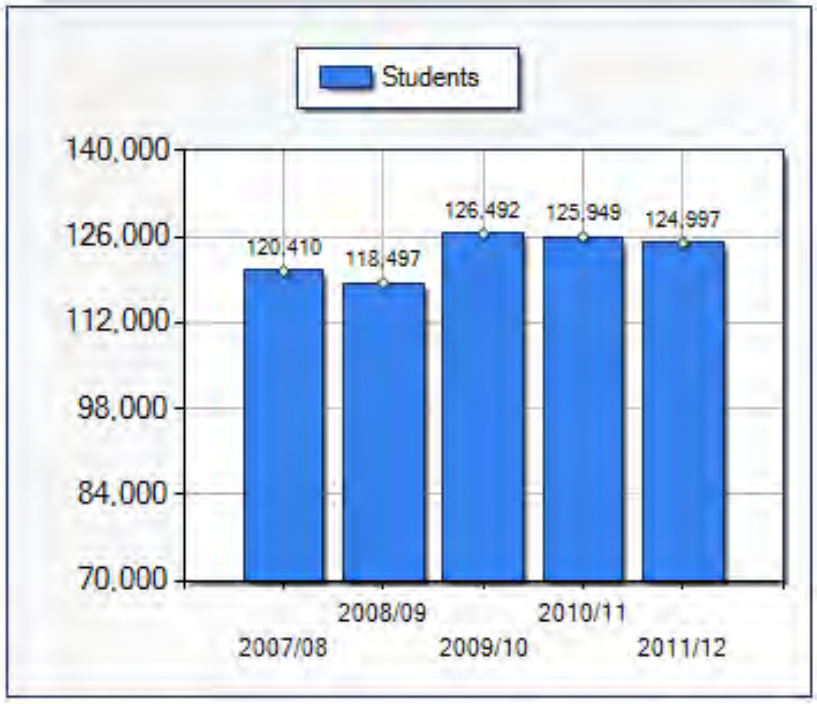
Consolidation of Schools Due to Construction Program



Increase in Enrollment Due to New School Model



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ADEC
Strategic Plan

Strategic Plan Implications for Design Standards

- "Students receiving more individualized teaching"
- By focusing on individuals, teachers can enhance motivation/satisfaction—and improve learning
- Education should be organized around teaching/learning for individual students vs. classes/groups

Strategic Plan Implications for Design Standards

- "Teachers would be able to adapt their teaching strategies and techniques to the standards and to meet the needs of individual students"
- "Students can enter top universities without a foundation year"
- "Teachers would have more freedom in the classroom"
- Give teachers more freedom to treat each student differently

ADEC priorities to elevate the quality of P-12 education and build internal capabilities (2009-2018)

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1. Elevate Schools Quality in Abu Dhabi to International Standards
2. Improve Access to P-12 Education
3. Provide Students with Affordable Options of High Quality Private Education
4. Preserve UAE Culture & Heritage and Develop Successful Careers

→ **P-12 Education**

5. Build ADEC Capabilities
6. Actively Engage the Stakeholders

→ **ADEC Capabilities**

ADEC is pursuing a two-pronged strategy addressing the long-term and immediate improvement imperative

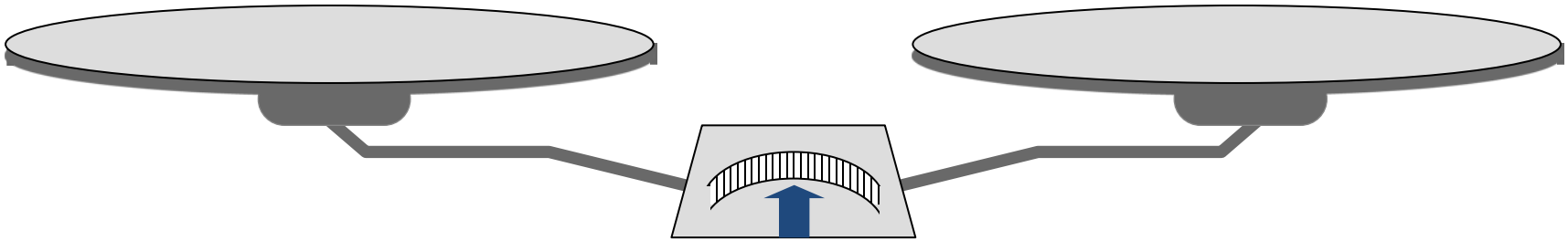
Overview of ADEC P-12 Strategy

Long-term Strategy

- ADEC will pursue a long-arching strategy to achieve dramatic quality improvements in P-12 education
- The reform will **address every component of the education system**

Immediate Improvement Imperatives

- About **67,000 students** are expected to graduate from high-school by the time the reform is fully implemented
- ADEC will pursue an **accelerated improvement program** to ensure graduates are equipped to pursue quality higher education:



The New School Model is a comprehensive blueprint for the targeted state of Abu Dhabi schools

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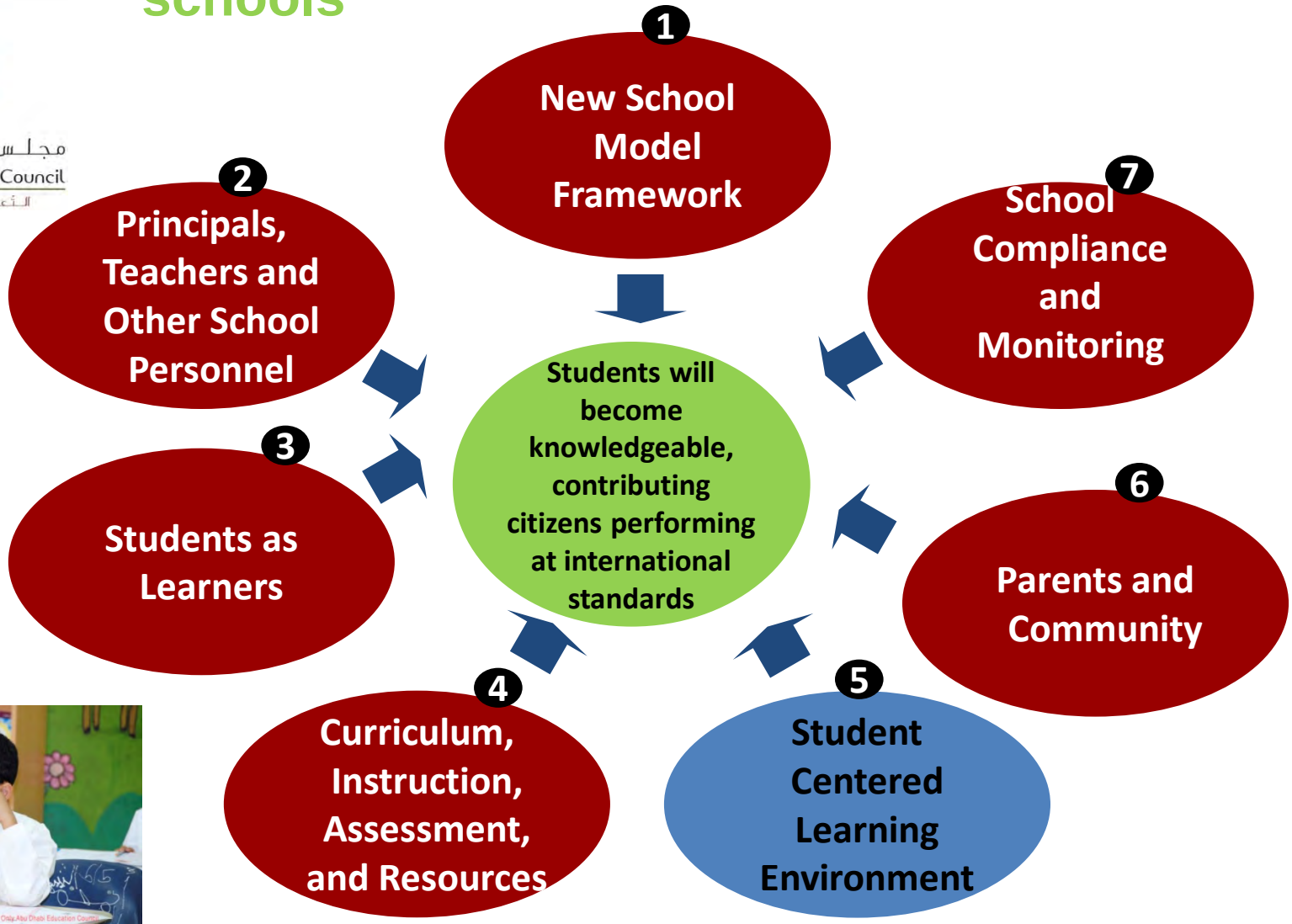

Student Centered Learning Environment

- World-class facilities which are educationally effective, sustainable and community centered
- School facility design based upon universal standards
- Technology-rich learning environments
- Proactive approach to ensuring health, safety, and well-being of all students

ADEC's Approach to School Design

Educationally Effective - provide superior teaching and learning environments that accommodates present and future needs.

Stimulating and Vibrant - provide environments that stimulate creativity and provide vibrancy.

Healthy and Productive - enable students and teachers to achieve maximum potential by providing healthy, safe, and comfortable environments.

Cost Effective - provide facilities that save money over time by being efficient to build, maintain, and operate.

Sustainable - minimize environmental impacts and maximizing the use of non-polluting, renewable resources.

Community Centered - create schools that are integral parts of their surrounding communities.

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Developing a Plan:

Selecting The Team

Selecting The Planning Consultants

The goal of the **"Development of School Design Standards"** Technical Assistance assignment is to develop school design standards for a new generation of world class K-12 school facilities in Abu Dhabi that enhance the learning environment while being energy and cost efficient. These schools are healthy, comfortable, energy and resource efficient, safe, secure, adaptable, and easy to operate and maintain.

Selecting The Planning Consultants

Specific Objectives:

- Establish a vision for the future of educational design in Abu Dhabi, and translate it into specific pattern guidelines for learning environments
- Develop best practice School Design Standards that are tailored to Abu Dhabi climate specifications.
- Develop tools for measuring school facilities' relevance to education, and for assessing the compliance of schools with standards and requirements, and provide training to the infrastructure and facilities teams.

Design Standards

School Tours

Consultant Team Observations:

1. Student-Centered Learning Focus
2. 21st Community Learning Centers Instead of 20th Century Schools
3. Consider More Uniformity in School Sizes
4. Consider School Design Standards as a “Kit of Parts”
5. School Design Standards to Mirror Research and Best Practice “Patterns”
6. Integrated PD – Team Teaching and Learning
7. Student Wellbeing Focus
8. Better Support of Information and Communications Technology
9. Better Support of Design, Art, Science and Technology

Learning Communities

Getting Started

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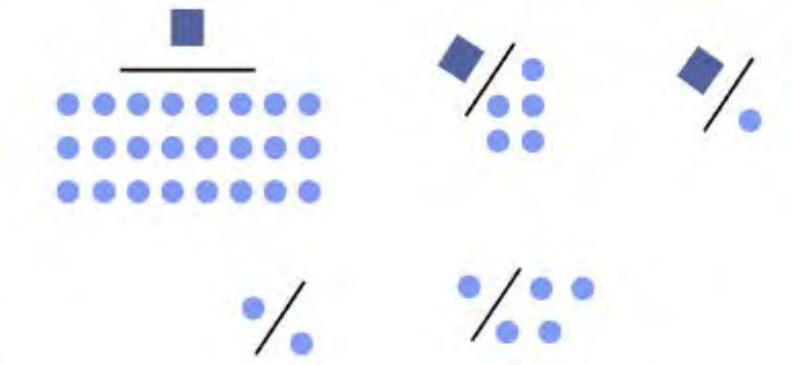
Organize school spaces in learning communities that permit/encourage the use of varied modes of instruction with varied size groups with varied schedules - all suited to achieving exceptional results for individual students.



Learning Communities

Getting Started

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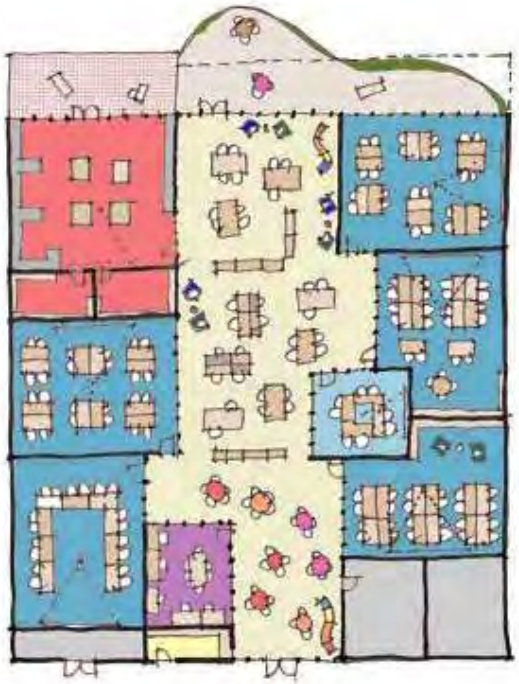
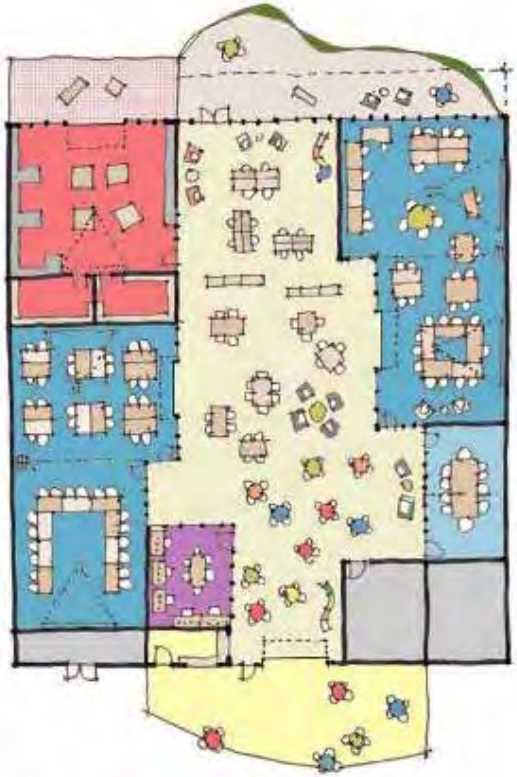
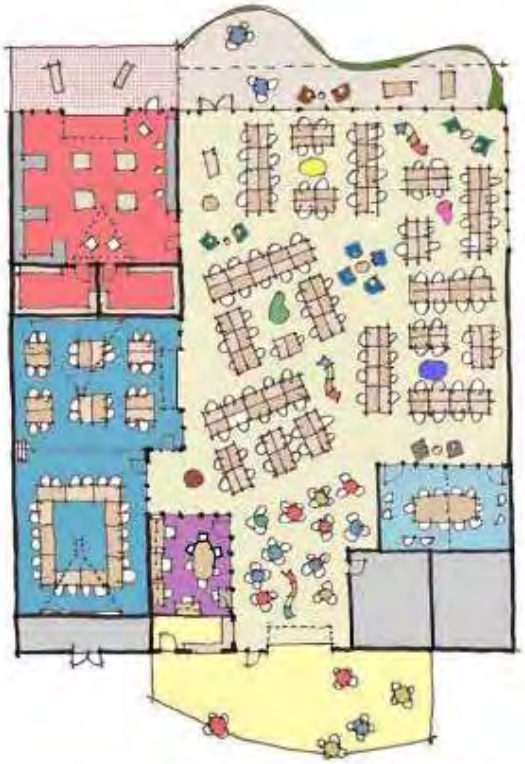


Learning Studio Model (4)



Learning Suite Model (7)



Student Advisory Model (9)

What is a Learning Community?

Community psychologists McMillan and Chavis (1986) state that there are four key factors that defined a sense of community:

(1) Membership
(2) Influence
(3) Fulfillment of individuals needs
(4) Shared events and emotional connections

What is a Learning Community?

The participants of learning community must feel some sense of loyalty and belonging to the group (*membership*) that drive their desire to keep working and helping others.

What is a Learning Community?

The things that the participant do in must affect what happened in the community, that means, an active and not just a reactive performance (*influence*).

What is a Learning Community?

Besides a learning community must give the chance to the participants to meet particular needs (*fulfillment*) by expressing personal opinions, asking for help or specific information.

What is a Learning Community?

Share stories of events with particular issue included (*emotional connections*) emotional experiences.

Learning Communities

How does it look?

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Learning Communities

How does it look?

Learning Communities

Characteristics, Objectives

- Schools are divided into small groups/communities of teachers + students—1 grade or several grades
- Teachers and students work together over time—get to know each other well
- Each community at each level, addresses/integrates all of the core disciplines—teachers collaborate re: instructional methods, time and students.
- Student spend most of each day in their community—go out for electives, career, PE/sports, library and food services

An ADEC Learning Community Comprises:

- Four to Five Classrooms
- One Science/Art Room
- A Breakout Space
- Teacher's Stations
- Storage and Restrooms

Conceptualization of the New Approach:

Giving Definition

Learning Communities

Kindergarten

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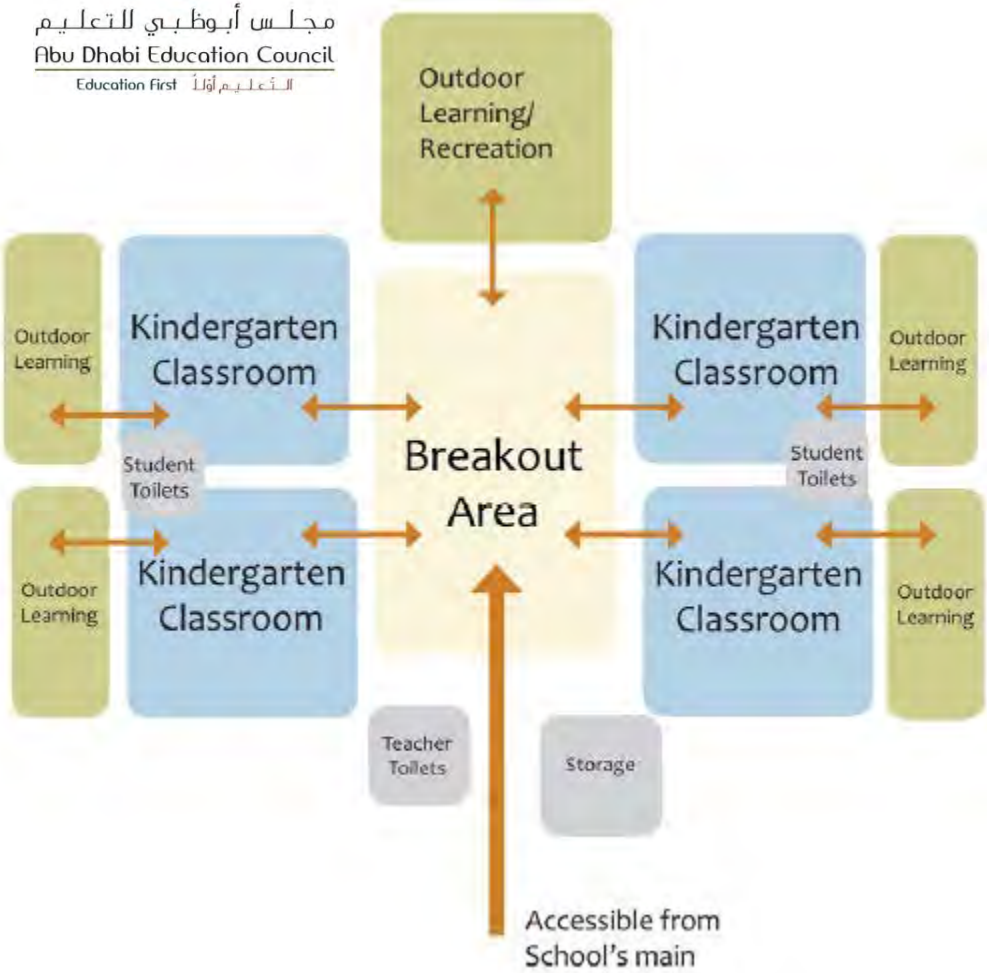

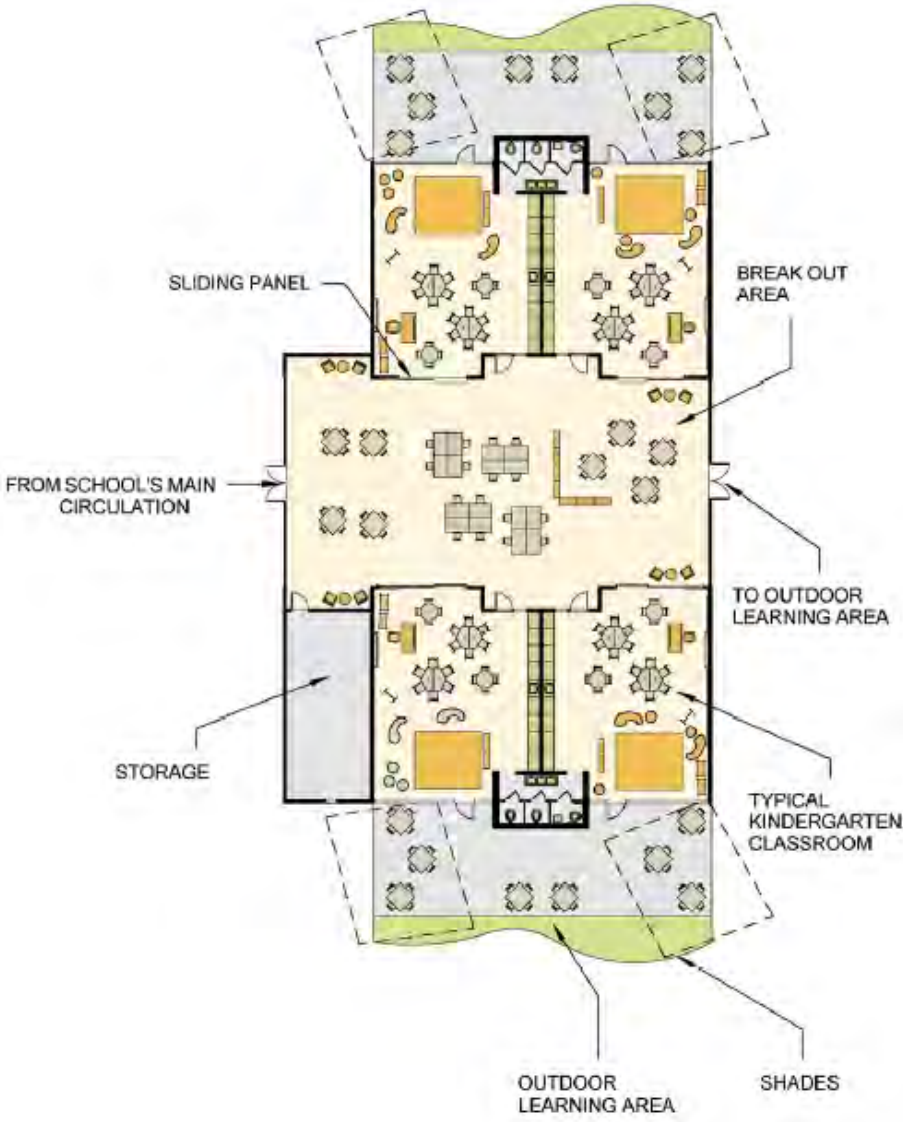

Learning Communities

Cycles I, II, III

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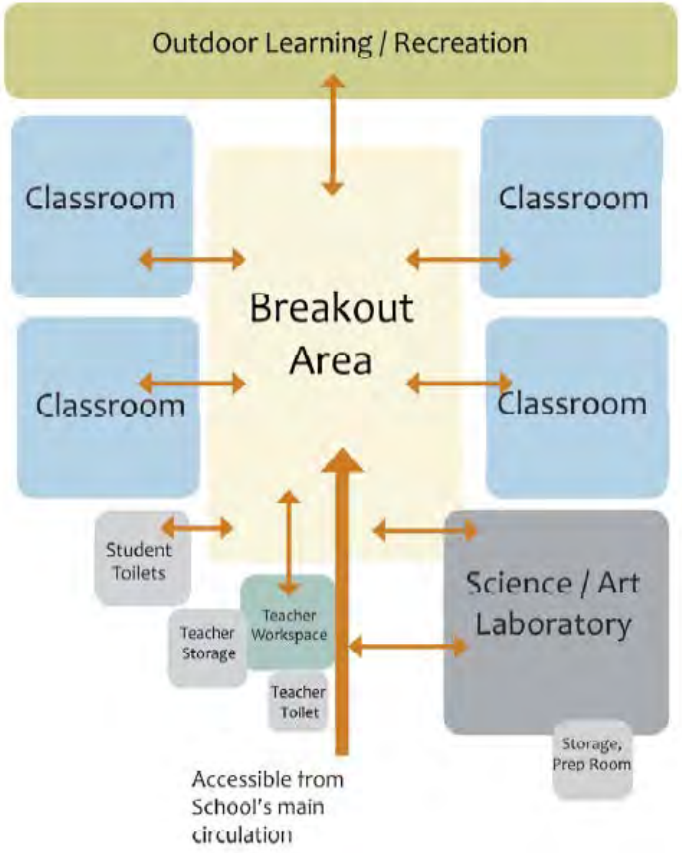

Learning Communities

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Two gender Cycle I (1250 Students) plus KG

PHASE IV SPACE PROGRAMS - CYCLE I PLUS KG OF 160				
			Two genders	
Total students			1250	
Number of classrooms per Learning Communities			5	
		Unit area in m2	Number	Area in m2
1 Educational spaces				
Learning communities			10	
Classrooms for 25 students		65	50	3,250
Science/ art labs	4 for art and science, 2 for art	90	6	540
Lab Storage, Prep Room		15	4	60
Toilets		6	50	300
Breakout space for LC of 5 class		227	10	2,270
Teacher's workplace		40	10	400
Teacher Toilet		4	10	40
LC Storage		25	10	250
Subtotal learning communities				7,110
Outside learning				
Shaded area	One per two classrooms	40	25	1,000
Other outside areas	One per classroom	40	50	2,000
Subtotal outside learning				3,000
Subtotal net built up educational spaces				9,379
Subtotal net educational spaces				12,379

Learning Communities

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Learning Community; Functional Requirements

The Learning Community is comprised of 4 or 5 Classrooms plus a larger multipurpose room for use as a laboratory, art, science or ICT as per the space program., plus a Teacher's Work Space, Storage and toilets.

Classrooms

Function

- Teaching, learning, in multiple modalities.
- Students, Teachers work in varied-size groups and spaces for varied periods of time each day, 1 Teacher + 1 Aide per classroom in Cycle I.

Spatial Relationships

- Classroom accessible from the Breakout Space within each Learning Community. No direct access from school's general circulation.
- Partition between Classroom and Breakout Space to be approximately 50% clear glass and operable to open/ connect two areas and facilitate movement and visual contact of students and teachers.
- Each Classroom shall be linked to the Breakout space by a transparent solid, sound resistant sliding or folding panel.
- Provide indirect access to Outdoor Learning Areas through the Breakout space in Grades 1 through 12. In Kindergarten classrooms, provide direct access from the Classroom to Outdoor Learning Areas.

Character & Ambiance

- Square or almost-square room proportions.
- High degree of flexibility, fixed case work located along one wall for kindergarten and Cycle I classrooms. Base cabinet heights to be 65 cm for KG and 70 cm for Cycle I. Spaces within Classroom can be defined by area rugs, furniture that teacher/ students can rearrange.
- Natural light, view/ access to exterior/ Outdoor Learning Area. Natural light must be controlled architecturally (via orientation, overhangs, external shading devices) to minimize heat gain and glare within space. Design for comfort without any shades or blinds within the classroom
- Must be able to vary artificial light level within room - dimmers and /or switching
- Provide two (2) marker boards with interactive whiteboard in the middle.
- Explore options wall surfaces for display of teacher & student materials. Or provide tack boards for display of student work.
- Each Classroom in a Learning Community must meet these criteria, but each can incorporate features to allow the students and teachers to be creative.

Learning Community; Interior Standards (continued)

Science/Art Storage / Preparation Room

FLOORS:

- Ceramic, porcelain or granite tiles.

WALLS:

- Block with non-toxic/ low VOC plaster, Ceramic tile 600 mm over counter.

CEILINGS:

- Prefer no drop ceiling. Acoustic ceiling, 3 m in height, minimum Indirect lighting.

DOORS / WINDOWS:

- Door with 30 x 40 cm (min.) view panel. Tinted, insulated low 'e' glass windows with exterior shading device.

FURNITURE / MILWORK:

- Base cabinets with one sink at counter height with epoxy resin tops, sink, wall mounted upper cabinets (all cabinets lockable) along one wall and open shelving.
- Provide flat file storage for student art work, in storage rooms designated for art storage.

Breakout Space

FLOORS:

- Non-slip PVC or Linoleum resilient flooring for Cycle I; Ceramic/ Porcelain/ terrazzo tiles for Cycle II, III. Area rugs in KG.

WALLS:

- Block with non-toxic/ low VOC plaster, with transparent walls/folding/sliding partitions between break-out and classrooms.

CEILINGS:

- Prefer no drop ceiling. Acoustic ceiling, 3 m in height, minimum. Direct/ Indirect lighting.

DOORS / WINDOWS:

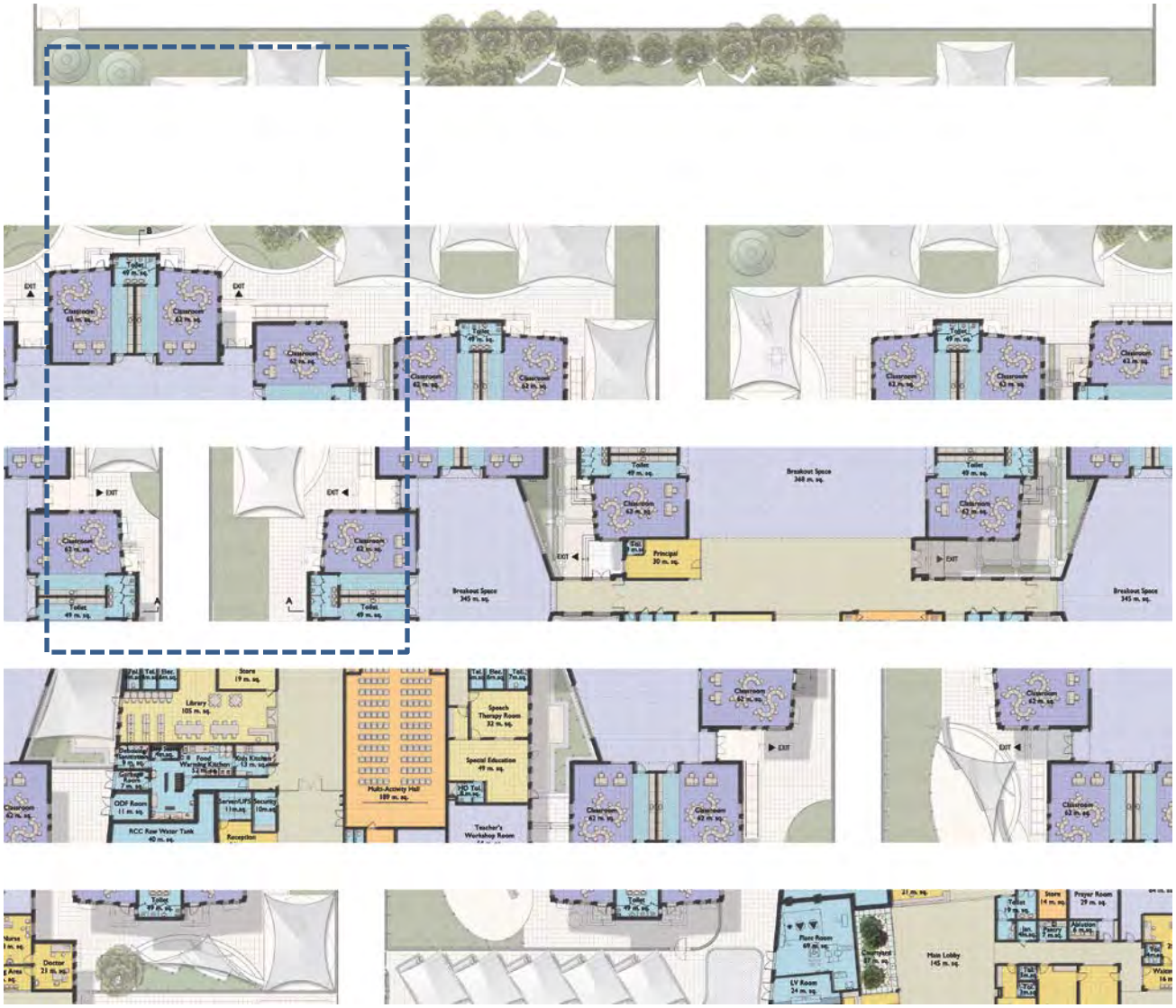
- If provided, tinted, insulated glazing with exterior shading device.

FURNITURE / MILWORK:

- Tables, chairs, some soft lounge seating. Some majlis seating groups. No fixed casework.

Learning Communities:
Stand alone Kindergarten aerial view

Design Model: Stand alone Kindergarten learning community floor plan



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Design Model: Stand alone kindergarten
Classroom, outside learning

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Design Model: Stand alone Kindergarten
main entrance, breakout space, outdoor learning

8 KGs completed in 2011/ 2012. 5 more under construction

Design Model: Cycle I with Kindergarten aerial view

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Design Model: Cycle I w/ Kindergarten
floor plan, learning community

Design Model: Cycle I w/ Kindergarten breakout space

Design Model: Cycle I w/ Kindergarten
outdoor learning

Design Model: Cycle I w/ Kindergarten

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10 Cycle I completed in 2011/ 2012. 6 more under construction

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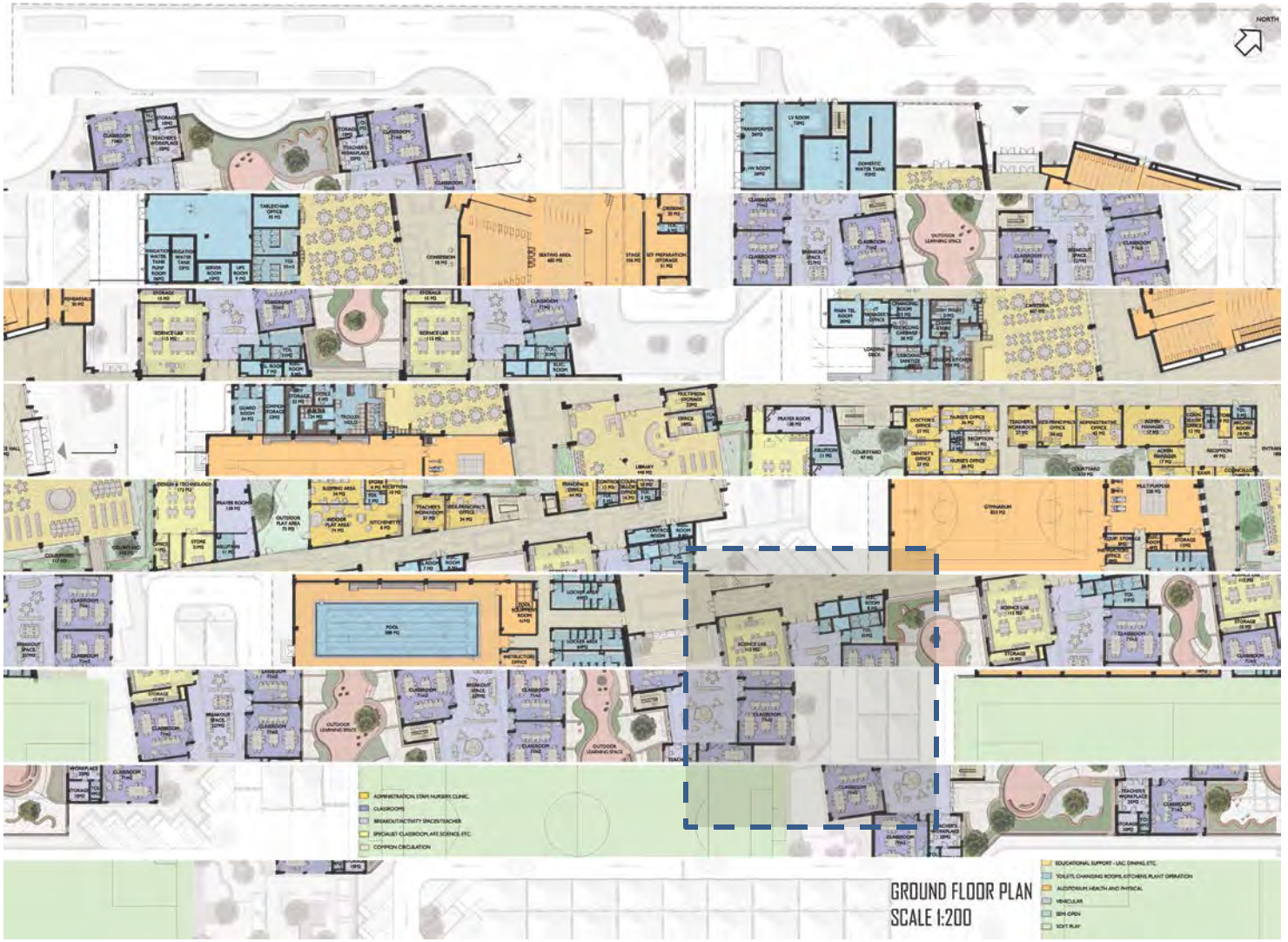
Design Model: Cycle II, III

aerial view

Design Model: Cycle II, III
floor plan and learning community



Design Model: Cycle II, III

breakout space

Design Model: Cycle II, III

outdoor learning

Design Model: Cycle II, III

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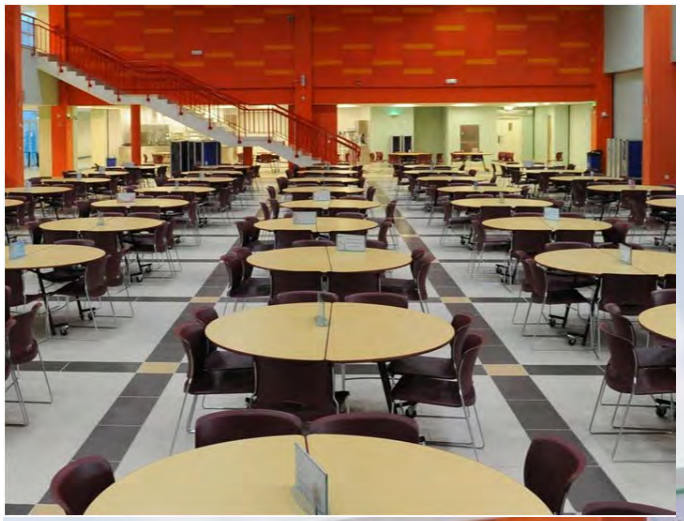

8 Cycle II, III completed in 2011/ 2012. 4 more under construction

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Executing the Plan:

Setting Standards

Design Standards

Process Flow

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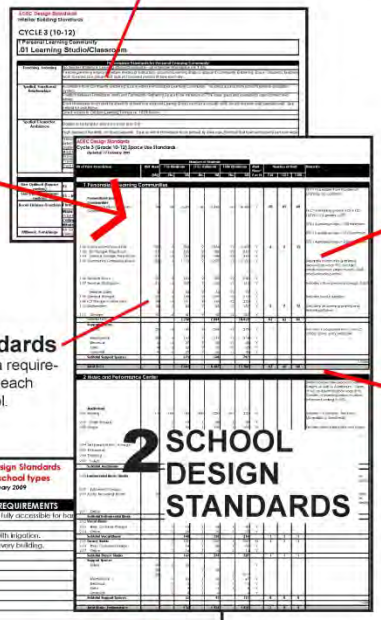
ADEC SCHOOL DESIGN STANDARDS

User's Manual- An Overview

1 ADEC Strategic Plan
The School Design Standards are intended to support and enhance the realization of the ADEC Strategic Plan.

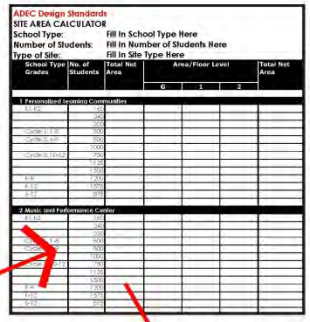
2a Space Use Standards
Define functional and area requirements for every space for each specific type/size of school.

2b Interior Building Standards
Detailed standards flesh out requirements for each significant space listed in Space Standards.

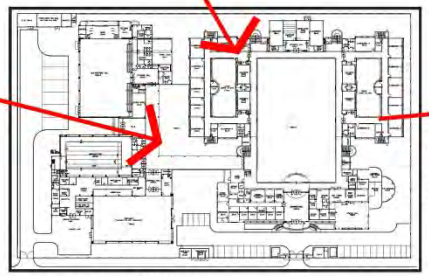


2 SCHOOL DESIGN STANDARDS

2c General Standards
Describe general requirements to be met by each type of school. General Standards work in combination with the Space Use and Interior Building Standards



3 Site Area Calculator
ADEC and school operators can use the Calculator in conjunction with the Space Use Standards to compute the site area required for any type of school on low, medium or high density sites.



4 Architectural Design
Archiects will design schools by working from the School Design Standards. At stipulated intervals during development of the school design and construction documents (prior to construction), the Architect will submit plans to ADEC for review/ approval. Before the school is occupied, ADEC will review the completed school for compliance with the School Design Standards.

Construction of a new School

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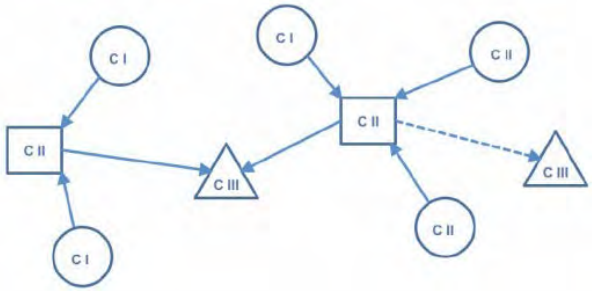
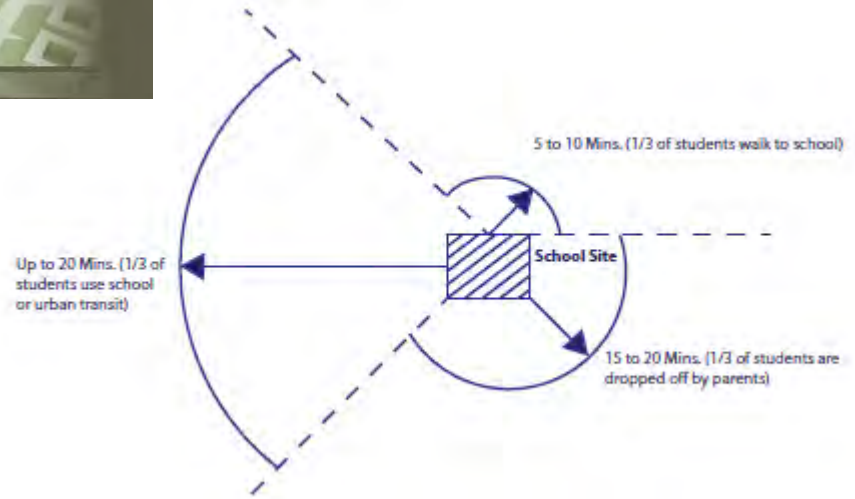
School Sites

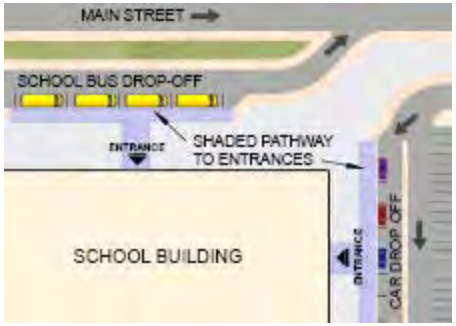




School Type and Size

Cycle	Cycle I		Cycle I + KG		Cycle II and III	
Kindergarten			240	320		
Number of students	625	1250	865	1570	875	1225
Gross area	9,900	18,000	12,500	22,600	14,300	18,200
Site area	20,400	30,400	23,800	36,000	23,800	30,400
Minumum site dimensions	170 x 120	190 x 160	170 x 140	200 x 180	170 x 140	190 x 160

Parking and Drop Off



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School Design

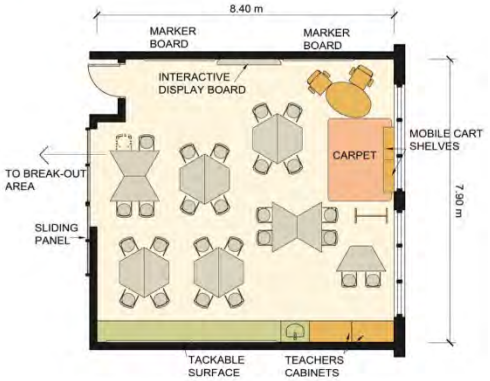
Educational Program analysis

Hours per week per subject in Cycle I

Subject	Class hours per student/ week: Grade 1, 2 & 3 per grade	Class hours per student/ week: Grade 4 & 5 per grade	For 1250 students or 50 group of students: Total spaces provided
Islamic Studies	4	4	
Arabic Language	8	8	
English Language	6	6	
Social Studies/Civics	1	2	
Math	5	5	
Total hs in classrooms per grade per group	24	25	50 Classrooms
Science	4	4	
Art	2	1	
Total hs in science/ art lab	6	5	10 Science/ art labs
ICT	1	1	ICT to be delivered in Breakout space
PE	2	2	2 spaces: Gym, Multipurpose, Outside field
Music	2	2	3 Music rooms
Availability per week	35	35	

Apply 90% utilization factor only for ICT, PE and Music in single gender schools and 80% in two gender schools

Classrooms. Cycle I
Example: Furniture arrangements



Learning Community; Functional Requeirments

Function	Teaching/ learning employs multiple modes of learning.
	4 or 5 Classrooms + 1 Science/ Art Lab in Cycle I and 1 Science Lab in Cycle II and III per Learning Community.
	Teacher stations in Teacher Workspace inside Learning Community
	Students, Teachers work in varied-size groups and spaces for varied periods of time each day. 1 Teacher + 1 Aide per Instructional Space.

Learning Community; Interior Standards

Floors	Non-slip PVC or Linoleum resilient flooring. Area rugs in KG
Walls	Block with non-toxic/low VOC plaster, paint with tack board on two walls. Opaque operable walls to be vinyl. Double pane, transparent glass operable walls with metal frames in certain options.
Ceilings	Prefer no drop ceiling. Acoustic ceiling, 3m in height, minimum. In-direct lighting.

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Performance Standards

- Water, sewer, electrical service
- Lighting
- Thermal comfort and ventilation
- Acoustics
- Information and communications technology
- Fire alarm system
- Public address system
- Building automation system
- Landscape and outside areas
- Roofing and walls
- Doors, windows and glazing
- Cafeteria and kitchen
- Signage

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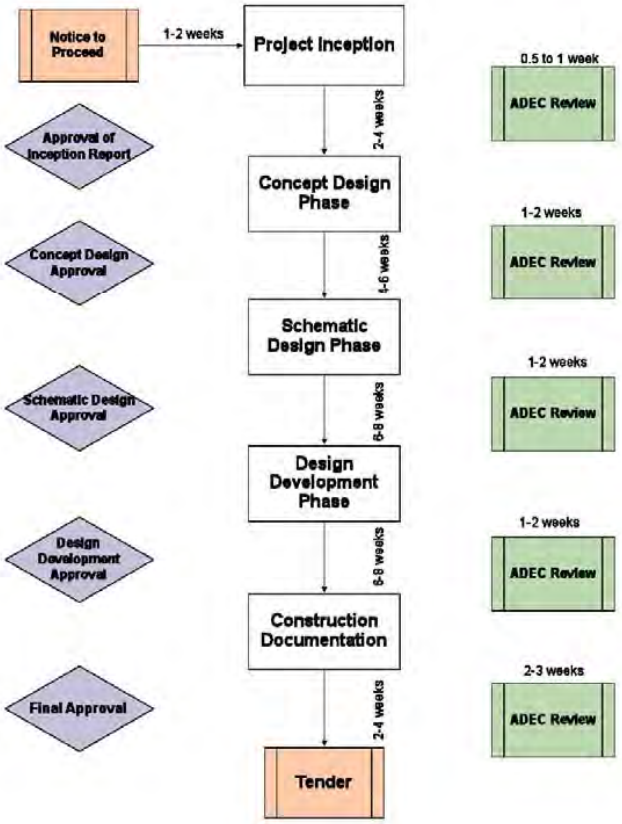
Design Strategies and Processes



- Sustainability
- Accessibility
- Constructability and durability
- Aesthetic design quality
- Integrated design approach
- Building information modeling
- Process description and deliverables

23 % energy reduction	• Passive systems • All classrooms lit with PV panels
30 % water savings	• Water saving devises • Water re-use
Recycling	• Construction process • Operations and maintenance

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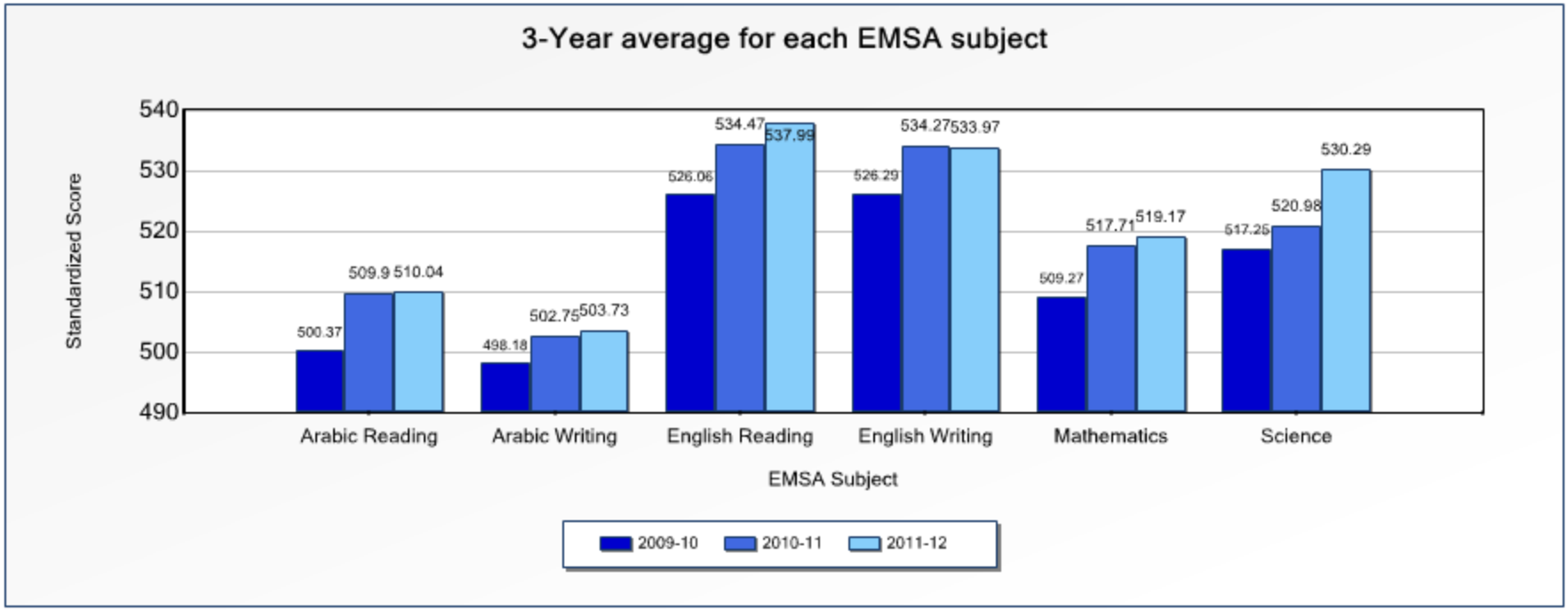
The Results:

Transformation of Education


3-Year average for each EMSA subject
Standardized Score
540
530
520
510
500
490
500.37
509.9
510.04
498.18
502.75
503.73
526.06
534.47
537.99
526.29
534.27
533.97
509.27
517.71
519.17
517.25
520.98
530.29
Arabic Reading
Arabic Writing
English Reading
English Writing
Mathematics
Science
EMSA Subject
2009-10
2010-11
2011-12

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Recently completed projects:

Al Hosn

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Recently completed projects:

Al Khatem

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Recently completed projects:

Al Khatem

Recently completed projects:

Al Khatem

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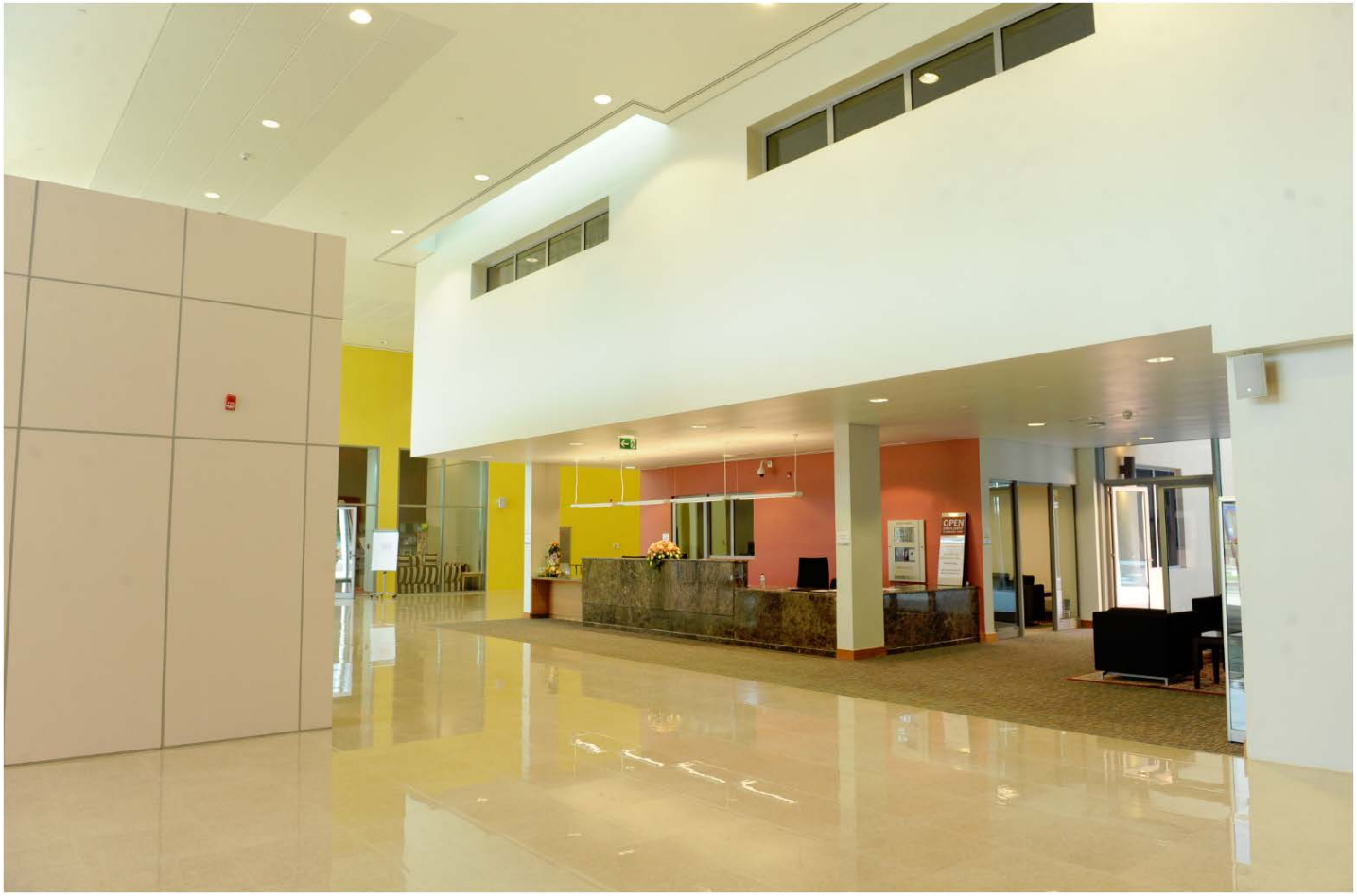
Recently completed projects:

Al Khazna



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Recently completed projects:

Al Goua

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Recently completed projects:

Abu Dhabi West

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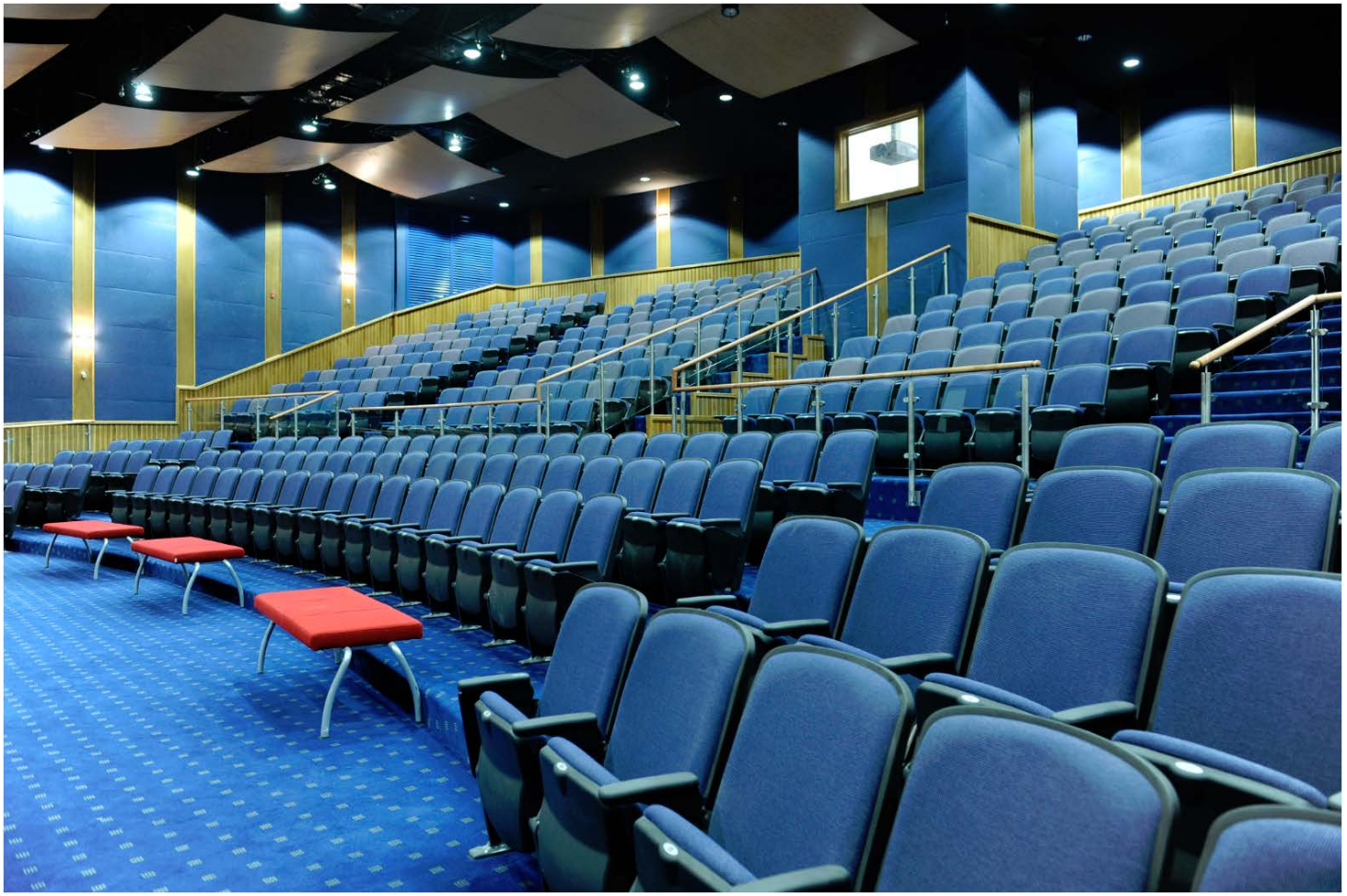
Recently completed projects:

Al Touaya



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Recently completed projects:

Mezyad

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Recently completed projects:

Al Ain

Thank You!

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