Curriculum Content Model

For

Emirates National School

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PREFACE

This provides a glance at the academic programming available to students who attend the Emirates National Schools.

ENS strives to provide a first-rate education to future leaders while preserving the beliefs that form the national identity. A common learning platform connects campuses in Abu Dhabi, Al Ain, and Mohamed Bin Zayed City and creates one system from pre-school to the doorway to college.

ENS combines ambitious yet achievable standards, a mix of assessments, and rigorous college preparatory courses. The American program of study prepares students to succeed in the best universities in the world.

On the way to graduation, students acquire the knowledge and skills that enable them to navigate in today's world. While English is the language of instruction, the curriculum features instruction for all secondary students in three languages (Arabic, English, and French) as well as Islamic and Arabic Studies. The path begins in Preschool and continues through Kindergarten and Primary School where it rests on a foundation of the International Baccalaureate program. The path ends in the secondary level program (separate Boy's and Girl's School) with the American Diploma Project and Advanced Placement courses where students can earn credits that are recognized by colleges all over the world.

Focused on the needs of each individual, ENS prepares students for the 21st century. Because success today means competing in an international marketplace, academic content is important but it is not enough. Skills matter. Inquiry, critical thinking and international mindedness are important. ENS students see how school connects with the world at large. The aim is to help students achieve their dreams.

Learning at ENS is a continuous cycle of improvement. Internationally-benchmarked standards set the target in each grade. Technology and other resources help guarantee each student's on-time arrival at the learning destination. In the classroom, teachers adjust instruction based on frequent progress monitoring. End-of-year assessments show the progress of students toward annual goals. Evaluation gauges system progress against international benchmarks. Accreditation by Advanc*ED* is used to certify the quality of an ENS education.

With tradition as its foundation, the Emirates National Schools strive to ensure students are proud of their heritage and that their families are proud of them.

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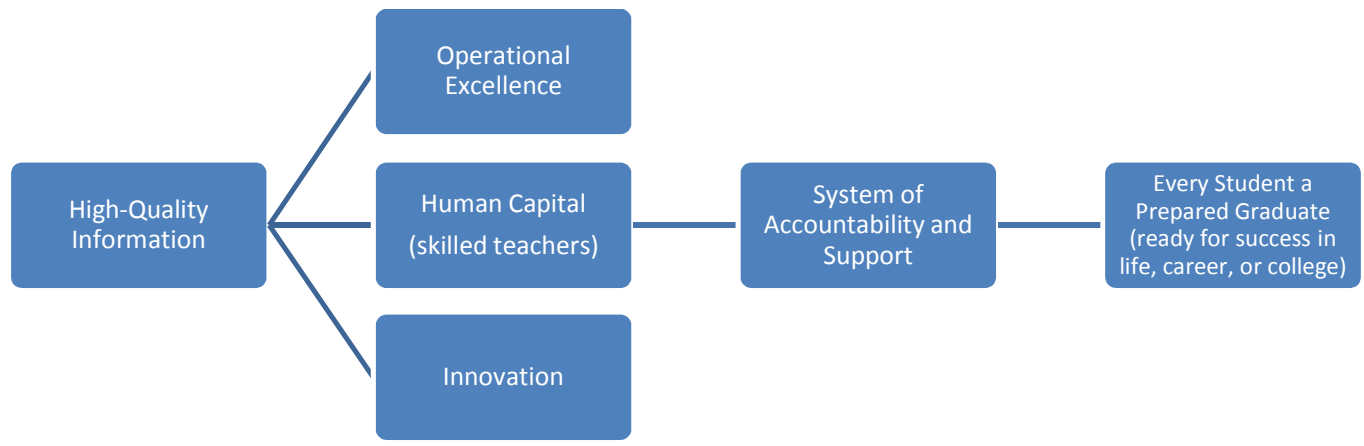
PART I: Context

Schools are defined by the quality of their outputs. Yet invariably, high-quality outputs are the result of healthy processes and structures. Generally, processes and structures are a mix of four elements. They are: (1) expectations; (2) opportunities; (3) incentives; (4) capacities. Figure 1 illustrates the inter-relationship of these elements at ENS.

Figure 1: Chart showing linkages between and among various functional areas within the Emirate National Schools



The Curriculum Content Model advances five high-level goals at the Emirates National School:
- Further the purpose of ENS (prepare clients for success in global knowledge-based economy);
- Ensure accountability and support (focus on continuous improvement, scalability and human capital);
- Preserve opportunity and access to education of the highest possible quality (advance equity interests);
- Provide useful results that lead to improved system performance (promotes utility and long-term sustainability);
- Supply first class education (deliver attractive return on investment and enhance reputation as premier program).

Table 1: Overarching aims and corresponding design principles that are the basis for the curriculum content model

High-Level Goals at ENS	Principles Guiding Design of Curriculum Content Model
Advance the central purpose of the organization	The effect of the system is to prepare students for success after high school, i.e., intent is for students to be prepared for success in college, career, or to compete in a global knowledge-based economy.
Ensure accountability and support	The system is balanced without being unduly focused on compliance. The system to appraise performance gauges both growth and status. It combines summative assessments with interim assessments that are used formatively to guide instruction.
Preserve opportunity and access to first-rate education	System reflects a belief that success is a birthright – or should be – for all ENS students and all Emiratis.
Provide useful results that lead to improved performance	Output from the system is culturally relevant for students and it helps teachers improve on practice.
Supply a first rate education; deliver return on investment	The system is recognized internationally and yields benefits that outweigh costs.

PART II: Definitions

Critical terms defined: Unless the context otherwise requires:

1. The term "curriculum" means:
   - A description of the broad goals and specific aims of learning;
   - The sequencing of content and skill to be learned;
   - A pre- and post-assessment of knowledge and skills; and
   - A conceptual map showing how a program fits within a framework of theory, research, and practice.
   Source: "Impact of Gagne's Work on Instructional Theory"; Smith et alia, pg 147-181, [Hass and Tyler]

2. The term "complete curriculum" means:
   This means "a working set of documents and practices that teachers collaboratively plan in professional communities to develop and refine deeper levels of detail regarding daily instruction and assessments . . ." According to the U.S. Common Core Project, "a 'complete curriculum' includes curriculum maps . . . [that provide] guidance about differentiating instruction to suit different types of students, for example: those who are reading above or below grade level, English language learners, etc. It could also include a scope and sequence, samples of student work, scoring rubrics, and -- ultimately -- suggested lesson plans. It may include pacing suggestions to guide instruction of content and skills in ways that address specific student objectives and link them to the standards. Other detail may include important vocabulary, assessment blueprints, pacing of instruction, etc.
   Source: U.S. Common Core Project , http://commoncore.org

3. The term "curriculum model" means a comprehensive, research-based set of principles that explain how (and why) the content and composition of a teaching program should be structured so it bridges theory and practice and it has a positive effect on student learning and performance. It spells out a theory of action that identifies underlying assumptions that inform and guide teaching. It can (but need not necessarily) include guidelines for the structure of activities and the way that learning activities are organized.
   Source:

4. The term "accountable" means responsive. To determine the adequacy of efforts, a frame of reference is needed (i.e., who is accountable, to whom, and for what). In this respect, accountability can be judged by comparing performance to criteria. It can be gauged with different frameworks:
   - Bureaucratic (performance is judged by whether it conforms to a set of rules);
   - Performance (performance is judged according to some agreed-upon measuring stick);
   - Market (performance is judged by whether customers demand services);
   - Professional (performance is judged by whether the actions taken benefit the client).
   Source: Adamowski, "Quality Improvement and K12 Accountability: 2nd Generation Model", ECS, 2003

5. The term "content standards" means the desired knowledge and skill that a prepared graduate should possess.

6. The term "performance standards" means the level of expected or acceptable proficiency with respect to some particular knowledge or skill. In the vernacular, it answers the question, How good is good enough?

7. The term "formative" means frequent monitoring of student understanding and progress throughout the year for the purpose of adjusting instruction.

8. The term "summative" means end-of-the-year evaluation of student performance.

9. The term "validity" means something measures what it purports to measure.

10. The term "reliability" means trustworthiness (similar findings result from repeated independent assessment).

11. The tem term "school readiness" means both the preparedness of a child to engage in and benefit from learning experience, and the ability of a school to meet the needs of all students in preschool and kindergarten. School readiness is enhanced when schools work collaboratively with families to ensure that every child is ready for higher levels of learning in academic content.
    Source: Based on analyses conducted by WestEd Lab and Dr. L. Kagan on behalf of Colorado and research published by National Association for Education of Young Children. See Part IV titled "School Readiness".

12. The term "college and career readiness" means the knowledge, skills, and behaviors essential for high school graduates to be prepared to enter college and career and to compete in the global economy. To be college and career ready, students are equipped to demonstrate they are competent with respect to pre-established knowledge and skill and do not require the need for additional remedial instruction or training.
    Source: Based on research conducted by Achieve, the American Diploma Project, College Board, American Association of Universities, Pew Charitable Trust, Education Policy and Improvement Center, ACT, the Partnership for 21st Century Skills, the Society for Human Resources Management, and the State of Colorado). See Part V titled "College and Career Readiness".

PART III: Theory of Action

A theory of action identifies the assumptions that inform actions related to teaching and learning. The "UAE National Charter for 2021" provides a platform for the ENS curriculum model (Gulf News, Feb. 2, 2010, pg 4)

Theme: Education
All Emiratis will have equal opportunity and access to first-rate education that allows them to develop into well-rounded individuals, enhance their educational attainment, and achieve their true potential, contributing positively to society.

Theme: Knowledge
Innovation, research, science and technology will form the pillars of a knowledge-based, highly productive and competitive economy.

Theme: Human Capital
A diversified and flexible knowledge-based economy will be powered by skilled Emiratis.

These statements reflect a concept that is central to the Curriculum Content Model. Schooling should enable all graduates to ready for success in life, career, or college. The ENS curriculum model expresses what it means to be "ready for success in life, career, or college" and how to achieve that for all students.

Economists make a distinction between two competing approaches to education. On one hand, some systems rely on signaling devices to certify learning has occurred (the accumulation of credits, Carnegie units, and degrees). On the other hand, some systems organize around direct measures that document the development of human capital ("Beyond Signaling and Human Capital", Arcidiancono, 2008, "Schooling as Human Capital or Signal", Kroch, 1994).

A diploma generally signifies graduates have attained a certain level of accomplishment. The truth of that claim is tested when students step into college or the workplace. There, what matters most is if they possess the knowledge and skills that the diploma represents. What matters most is the learning, not a grade, a score, or a piece of paper.

A variety of entities use a definition of "college and career readiness" to anchor standards. While a diploma should be a proxy for a set of skills and knowledge, what matters most is students leave school not just with a diploma but with the knowledge and skills it represents. To be sure, grades and scores matter for entry into college. What really matters most is whether students have accomplished the learning that is represented by the grades and scores.

- Achieve (American Diploma Program): "The English and mathematics that graduates must master by the time they leave high school if they expect to succeed in postsecondary education or high-performance jobs."

- American Association of Universities (and Pew Charitable Trust): "Standards for university success apply to six content areas describe the knowledge and skills required to do well enough in college entry-level core academic courses to meet general education requirements and to continue on to major in a particular area."

- ACT: "A set of standards that describes levels of preparation a student needs to be ready to enroll and succeed – without remediation – in credit-bearing course at a two-year or four-year institution, trade- or technical-school."

- Education Policy and Improvement Center: "The level of preparation that a student needs in order to enroll and succeed – without remediation – in a credit-bearing general education course at a postsecondary institution."

- College Board: "Successful performance in entry-level college courses, including Advanced Placement courses, as described by sets of English language and mathematics content standards."

- Society for Human Resources Management and the Partnership for 21st Century Learning: "Basic knowledge and skills as well as the applied skills necessary to succeed in the workplace.

PART IV: School Readiness

School Readiness describes both the preparedness of a child to engage in and benefit from learning experiences, and the ability of a school to meet the needs of all students enrolled in preschool and kindergarten. School Readiness is enhanced when schools and families work collaboratively to ensure that every child is ready for higher levels of learning in academic content that occurs when they enter Primary School.

PART V: College and Career Readiness

When students graduate they should possess the knowledge and skills that enable them to navigate successfully in today's world. To that end, the Board of Directors for the Emirates National School have set forth a strategic vision that makes a commitment to organizing curriculum around ambitious yet achievable academic standards (based on Achieve) and an approach to graduation that rests on the work of the American Diploma Project and the tenets of International Baccalaureate (IB). ENS is committed to a course of action that leads to accreditation by Advanc*Ed* and authorization by IB. The Curriculum Content Model is a step toward that goal.

What follows is a list of the knowledge and skills that a prepared graduate should possess (see Figures 2 and 3 for graphic display).

A. Content Knowledge

World Literacy, Arabic, English and other Languages

- Employ standard Arabic and English languages (and other languages as appropriate) properly and fluently in reading, writing, listening, and speaking
- Read fiction and non-fiction, understanding conclusions reached and points of view expressed
- Write clearly and coherently for a variety of purposes and audiences
- Use logic and rhetoric to analyze and critique ideas
- Access and use primary and secondary sources to explain questions being researched

Mathematical Sciences

- Think critically, analyze evidence, read graphs, understand logical arguments, detect logical fallacies, test conjectures, evaluate risks, and appreciate the role mathematics plays in the modern world, i.e., be quantitatively literate

- Understand and apply algebraic and geometric concepts and techniques
- Use concepts and techniques of probability and statistics
- Apply knowledge of mathematics to problem solve, analyze issues, and make critical decisions that arise in everyday life

Science
- Think scientifically and apply the scientific method to complex systems and phenomena
- Use theoretical principles within a scientific field and relevant empirical evidence to make and draw conclusions
- Recognize that scientific conclusions are subject to interpretation and can be challenged
- Understand the core scientific concepts, principles, laws, and vocabulary, and how scientific knowledge is extended, refined, and revised over time
- Design and conduct research

Social Science Traditions
- Identify and describe historical, social, cultural, political, geographical, and economic concepts
- Interpret sources, and evaluate evidence and competing ideas
- Build conceptual frameworks based on an understanding of themes and the overall flow of events
- Understand how government works in the United Arab Emirates and in other countries, the varying roles individuals may play in society, and the nature of civic responsibility
- Interpret information from an Islamic and/or a global perspective

Arts, Music and Humanities
- Understand and appreciate how the arts and humanities (expressions of identity through language, movement, sound, and visual representation) contribute to and shape culture and our understanding of culture
- Understand how the arts and literature are used as instruments of social and political thought
- Identify leading innovators in the arts and humanities and the contributions they have made to their respective art forms

Physical Education and Healthy Living
- Attend to personal health and wellness
- Stay fit and eat healthy meals
- Lifelong personal fitness

B. Learning Skills

Critical Thinking and Problem Solving
- Apply logical reasoning and analytical skills
- Conduct research using acceptable research methods
- Understand different research approaches
- Collect and analyze quantitative and qualitative data and research
- Evaluate the credibility and relevance of information, ideas, and arguments
- Discern bias, pose questions, marshal evidence, and present solutions

Find and Use Information/Information Technology
- Select, integrate, and apply appropriate technology to access and evaluate new information
- Understand the ethical uses of information
- Provide citations for resources

Creativity and Innovation
- Demonstrate intellectual curiosity
- Generate, evaluate, and implement new ideas and novel approaches

- Develop new connections where none previously existed

Global and Cultural Awareness
- Appreciate the arts, culture, and humanities
- Interact effectively with and respect the diversity of different individuals, groups, and cultures
- Recognize the interdependent nature of our world
- Understand how communicating in another language can improve learning in other disciplines and expand professional, personal, and social opportunities

Civic Responsibility
- Recognize the value of civic engagement and its role in a healthy civil society
- Be involved in the community and participate in its political life
- Balance personal freedom with the interests of a community

Work Ethic
- Plan and prioritize goals
- Manage time effectively
- Take initiative, and follow through
- Learn from instruction and criticism
- Take responsibility for completion of work
- Act with maturity, civility, and politeness
- Demonstrate flexibility and adaptability

Personal Responsibility
- Balance self-advocacy with the consideration of others
- Possess financial literacy and awareness of consumer economics
- Behave honestly and ethically
- Take responsibility for actions
- Understand the relevance of learning to college and career readiness
- Demonstrate awareness of and evaluate career options
- Attend to personal health and wellness

Communication
- Read, write, listen and speak effectively
- Construct clear, coherent, and persuasive arguments
- Communicate and interact effectively with people who have different primary languages

Collaboration
- Work effectively with others
- Acknowledge authority and take direction
- Cooperate for a common purpose
- Use teamwork and leadership skill

Lifelong Learner
- Self-propelled and independent

PART VI: Culminating Project and Service Learning

The Path to Graduation - Prior to graduation, students complete two projects:

The ENS Model Diploma Culminating Project has the following characteristics:

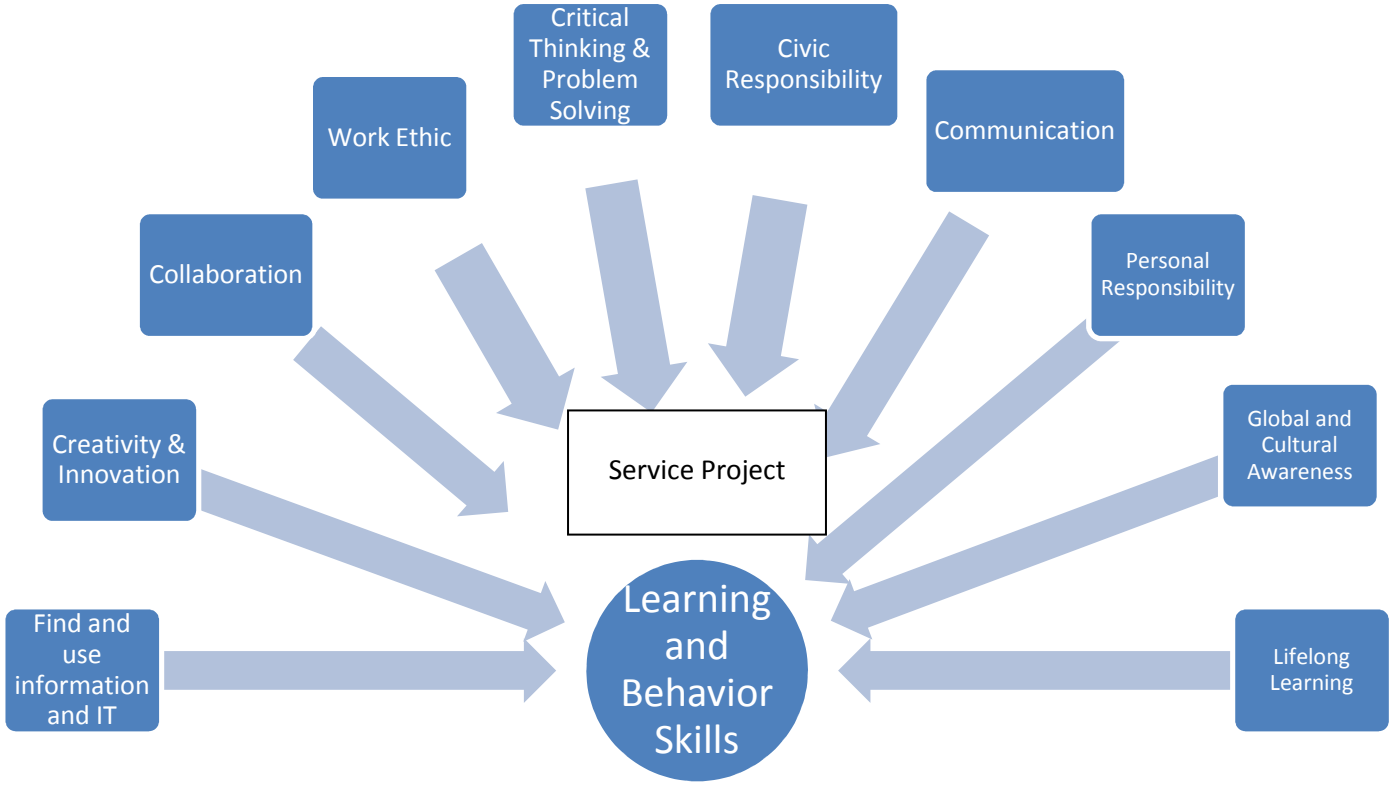
- The purpose is to demonstrate the ability to complete a comprehensive project using skills and content ability learned through formal education;
- The task is to identify a researchable area of focus that requires the application of problem-solving activity (and to pose a question worthy of study);
- Calls upon students to design the study to include a search of the literature, data collection, and a method of analyzing data; and
- Requires students to execute the study and answer the research question.

The ENS Service Learning Component of the Diploma Project:

- Translates knowledge into action that provides a benefit to others or the community;
- May include artistic activity, civic work, or international expeditions;
- Intent is to apply what has been learned in school in a real-world setting; and
- Builds confidence in the student's ability to make a difference in the world.

The charts that follow (see Figures 2 and 3 below) depict this knowledge and skills graphically.

Figure 2: Chart illustrating the learning skills that enable ENS graduates to be prepared for success in life, career, or college (these correspond to the IB profile)



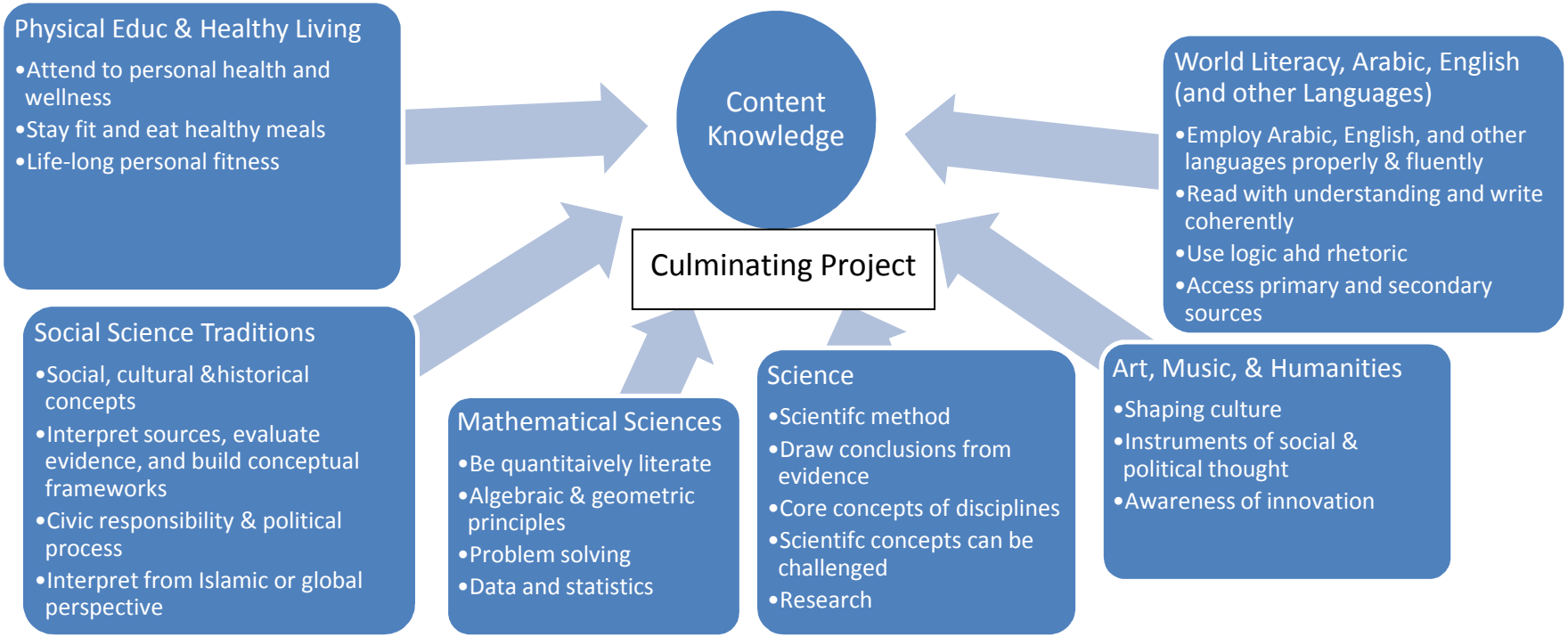


Figure 3: Chart illustrating the content knowledge that enables ENS graduates to be prepared for success in life, career, or college

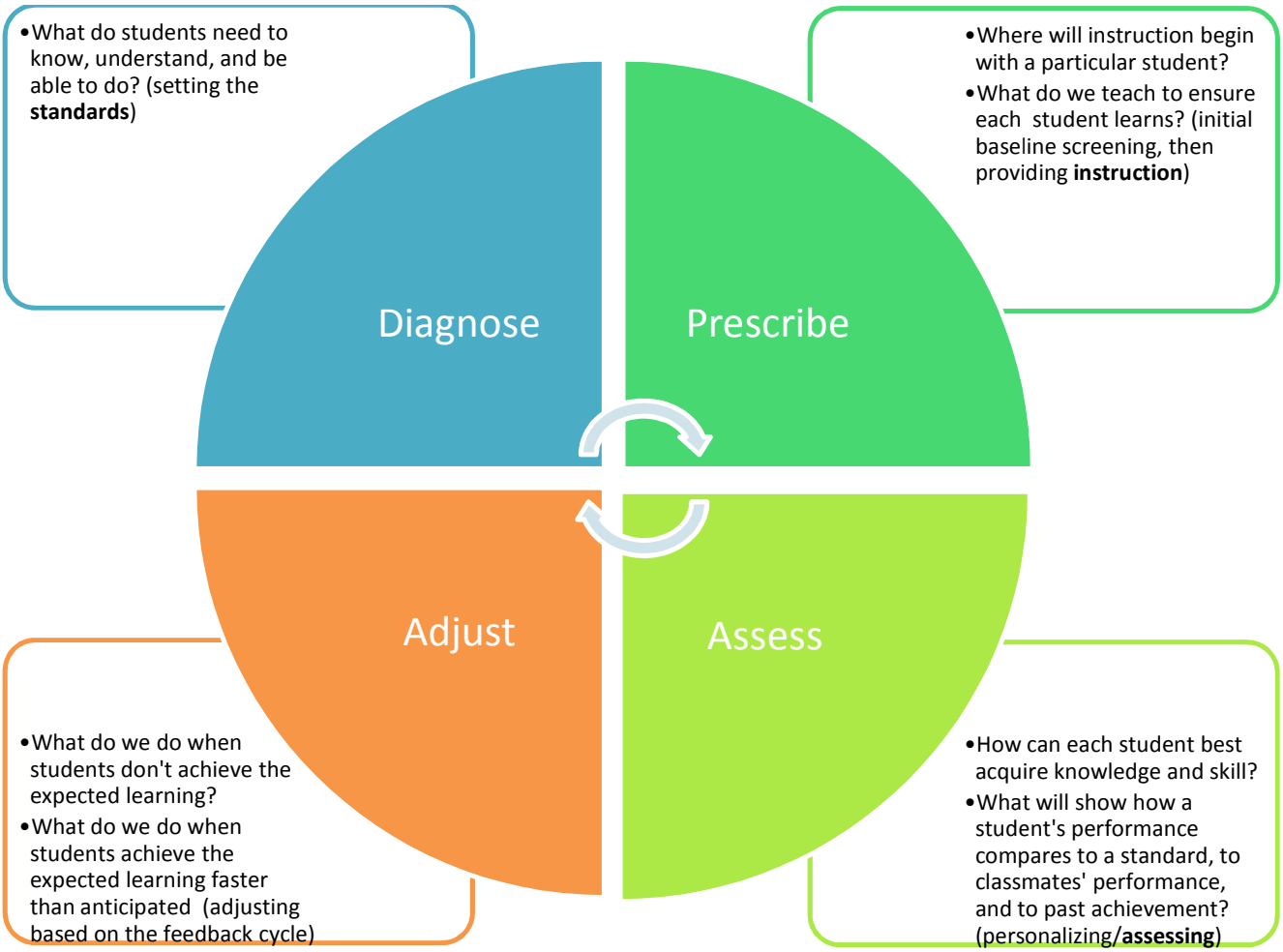
Table 2: Expected Knowledge and Skills at Grades 5, 8, and 12 for ENS Students in Language (Arabic, English, etc) and Mathematics (Source: National Assessment of Educational Progress)

Prepared Graduate Expectations	*Grade 5 Proficiency*	*Grade 8 Proficiency*	*Grade 12 Proficiency*
Language (Arabic, English, others)			
- Use standard forms to read, write, listen, and speak	Use standard form of language to communicate in social/academic context and in routine ways. Be understood and understand communication with adults	Read and understand newspapers. Grasp central ideas from formal academic language. Understand more-complex ideas (convey them coherently)	Formulate, convey, understand, evaluate, and respond to sophisticated multi-stage arguments. Express and understand complex ideas
- Comprehend text (point of view and conclusion)	Integrate and interpret oral and written text	Summarize main ideas and themes. Make and support inferences. Connect parts of a text.	Draw conclusions and make accurate inferences that go beyond the literal. Understand rhetorical devices and formulate a compelling argument.
- Write coherently, for different purposes and audiences	Write to communicate socially, to interpret elementary literary texts, to report on an event or a topic, and to express ideas creatively	Write competently for range of purposes that include developing reports, creating poems, drafting letters to newspaper editors, etc	Structure writing for a full range of purposes that achieves its intended purpose, e.g., persuasive writing is "two-sided' in that it anticipates and addresses the best counter-argument
- Use logic and rhetoric to analyze and critique ideas	Discern bias and discriminate between fact from opinion	Analyze features of text. Substantiate judgments formed about a text.	Use sophisticated forms of analysis to interpret and judge a piece of text.
- Use primary and secondary sources to answer questions	Know difference between primary and secondary source material and use both to answer simple research questions.	Know when and why and how to locate the appropriate information from primary and secondary sources	Find and use specific pieces of evidence to support inferences drawn from sophisticated text.
Mathematics			
- Think critically and be quantitatively literate	Estimate and compute with accuracy using whole numbers (+, -, x, /). Know basic math facts. Conceptually understand fractions and decimals and use factions and decimals to perform straightforward calculations	Thoroughly understand arithmetic. Solve most practical math problems faced in life. Understand how fractions, decimals, percents and algebraic concepts operate and are related. Use evidence and logic to create and defend sound mathematical arguments.	Identify, manipulate, graph, and apply linear, quadratic, exponential, and inverse functions. Solve problems using same. Interpret soundness of mathematical arguments involving routine or non-routine problems and which rely on functions expressed in algebraic, tabular, verbal or graphical forms.
- Apply algebra and geometry concepts and techniques	Solve multi-step real-world problems using 4-function calculators, rulers, and geometric shapes. Approach arithmetic algebraically to solve for unknowns	Recognize relationship of geometry to real world phenomena. Use algebra fundamentals to solve rudimentary and some multi-stage problems.	Perform calculations with similar figures and right angle triangles. Apply algebraic and geometry concepts (relationships between 2- and 3-dimensional shapes) to solve complex problems.
- Use concepts/techniques of probability and statistics	Use graphs to solve problems that involve time, money, temperature. Understand randomness and chance	Use basic concepts of central tendency and "spread". Know what constitutes probability (as the basis for prediction)	Understand and use normal distribution to solve problems involving central tendency and variability

PART VII: Framework

Learning is a continuous cycle of improvement. Ambitious expectations (standards) set the target for learning. Plans are created and resources are marshaled (curriculum) to help ensure each student achieves the learning target. Teachers customize plans to address the needs of individual students. This helps provide each student with an optimal learning environment. As instruction takes place, teachers adjust instruction based on the results of frequent formative checks. Summative assessments are used to determine whether each student makes expected progress towards annual goals. Evaluation occurs to gauge progress of the system against international benchmarks and to ensure system improvement. (Note. Adapted from: Ainsworth, I., 2002, *Unwrapping the Standards*; Benson, D. et alia, 2008, *Standards-Based Teaching/Learning Cycle*; Carr, J.F. et alia, 2001, *Succeeding with Standards*; Hargreaves, A., 2001, *Learning to Change: Teaching Beyond Subjects and Standards*; Jacobs, H.H., 2004, *Getting Results with Curriculum Mapping*; Kendall, J. and Marzano, R., 2000, *Content Knowledge: A Compendium of Standards and Benchmarks for K12 Education*; Reeves, 2005, *The Leader's Guide to Standards*; Centennial BOCES, 2002, *Standards-Based Classroom Operators Manual*; Wiggins, G. et alia, 2005, *Understanding by Design*).

Figure 4: Chart showing how curriculum, assessment, and instruction interact in a standards-based system



PART VIII: Underpinnings

General principles that follow are the foundation for the curriculum content model for the Emirates National School.

1. Context of learning
   Learning is influenced by environmental factors, including culture, technology, and instructional practices.

2. Goals of the learning process
   The successful learner, over time and with support and instructional guidance, can create meaningful, coherent representations of knowledge.

3. Nature of the learning process
   The learning of complex subject matter is most effective when it is an intentional process of constructing meaning from information and experience.

4. Construction of knowledge
   The successful learner can link new information with existing knowledge in meaningful ways.

5. Standards and assessment
   Setting appropriately high and challenging standards and assessing the learner as well as the learning progress – including diagnostic, process, and outcome assessment – are integral parts of the learning process.

6. Strategic thinking
   Successful learners create/use a repertoire of thinking/reasoning strategies to achieve complex learning.

7. Thinking about thinking
   Higher order strategies for selecting/monitoring mental operations facilitate creative and critical thinking.

8. Motivational and emotional influences on learning
   What and how much is learned is influenced by the motivation. Motivation to learn, in turn, is influenced by the individual's emotional states, beliefs, interests and goals, and habits of thinking.

9. Intrinsic motivation to learn
   Creativity, higher order thinking and curiosity contribute to motivation to learn. Intrinsic motivation is stimulated by tasks of optimal novelty/difficulty, relevant to personal interests, and providing personal choice and control.

10. Effects of motivation on effort
    Acquisition of complex knowledge and skills requires extended learner effort and guided practice. Without learners' motivation to learn, the willingness to exert this effort is unlikely without coercion.

11. Developmental influences on learning
    As individuals develop, there are different opportunities and constraints for learning. Learning is most effective when differential development within/across physical, intellectual and emotional/social domains is considered.

12. Social influences on learning
    Learning is influenced by social interactions, interpersonal relations, and communication with others.

13. Individual differences in learning
    Learners vary in strategies, approaches, and capabilities for learning (that result from prior experience/heredity).

14. Learning and diversity
    Learning is most effective when differences in learners' linguistic, cultural and social backgrounds are considered

    Source: "Learner-Centered Psychological Principles: A Framework for School Redesign" (APA, 2000)

PART IX: Standards

On April 29, 2010 the board of directors of the Emirates National School adopted content standards for English and Mathematics. Based on the work of Achieve, Inc, these standards provide the platform for organizing learning and instruction. Later in June, on a recommendation from ENS teachers, the board considered proposed standards for Science (due for adoption in October, 2010). Plans are underway to present the board with standards for Social Studies early in fall, 2010. Following close behind will be standards for Arabic and Islamic Studies.

Achieve is a U.S.-based organization that sponsors the American Diploma Project. It has been deeply involved in development of a common set of standards that states have voluntarily adopted in the United States. These standards support the guidelines of Advanc*ED* and the tenets of International Baccalaureate (IB) because ENS is committed to action that leads to Advanc*ED* accreditation and IB authorization.

Standards are a way to structure knowledge, measure understanding, create consistency, and promote quality.

Structure Knowledge	The aim of schooling is to prepare students to perform at high levels. Yet what is meant by "high levels"? Standards are useful because they describe what it means to be well-educated. They identify the knowledge graduates are expected to acquire. If the goal of schooling is to prepare students for success in college and career, then standards define what it means to be "prepared". They also identify milestones along the way.
Measure Understanding	Schools that are organized around standards have certain features. Curriculum that teachers create is focused on learning targets that are represented by standards. Class activity is designed to help students master the knowledge represented by standards. Progress is measured regularly. Instruction is adapted based on assessment results.
Create Consistency	Standards make it possible to gather data from year to year and then compare changes in achievement over time as individuals and groups move from grade to grade. This allows parents and staff to judge the performance of students, classes, schools, and the system. It provides a basis for adjustments that build consistency.
Promote Quality	To improve quality, a mechanism is needed to gauge whether desired results are being achieved. Standards provide a way to accomplish that. Standards describe what teachers should teach and students should learn. By providing a focus for instruction, standards help ensure that teaching builds logically toward the goal. Without standards, teaching is activity in search of purpose. Standards promote quality by focusing staff on what matters most, namely all students achieving at high levels.

For several reasons, the adopted standards are similar but not identical to the standards produced by Achieve. In all but three respects, ENS-adopted standards in Mathematics and English are identical to the Achieve standards.

- The first exception is this. When needed, the standards were adapted so they are appropriate to the UAE culture. Attention in Mathematics, for instance, is focused on the UAE system of currency as opposed to currency in the U.S. system. Likewise, the focus in Mathematics is chiefly – although not exclusively – on the metric system.

- The second exception involves Mathematics standards for grade 12. Because Achieve does not offer standards that are appropriate for ENS student in this area ENS had to look beyond Achieve, Inc. For both Mathematics and English ENS adopted standards for grade 12 from the Advanced Placement program that is sponsored by the College Board.

- The third exception involves English standards for K-3. Because Achieve does not offer standards for this level, ENS approved the K-3 common core standards that states in the U.S. have adopted. Achieve was a part of the common core project and has endorsed these standards.

A word is in order about the organization of the content standards that were adopted by ENS. In Mathematics, grade-by-grade standards exist from Kindergarten through grade 11. In English, standards exist for a span of grade levels. For instance, grades 4-5, 6-8, 9-10, and 11-12.

The English standards are organized in the following fashion. The organization that is used from Kindergarten to Grade 3 is slightly different from the approach that is taken in all the other grades. English standards are arranged grade-by-grade from KG through Grade 3. Beyond that, standards span grade levels. For instance, there are standards for grades 4-5, grades 6-8, grades 9-10, and grades 11-12.

Within Mathematics, topics are arranged in five content strands (Number, Discrete Mathematics, Algebra, Geometry, and Probability and Statistics). There is an increasing degree of mathematical complexity within each area.

Support is underway for classroom teachers to assist in the implementation of adopted standards. For instance, a cross-campus team of 18 staff with expertise in Mathematics and English convened in June 2010 to advise ENS on how to take the standards and transform them into items that teachers can use to guide daily classroom instruction. These are called "companion guides" because they accompany standards. These exemplars have been created and are available to teachers beginning in August, 2010. In part, these documents will form the basis for subsequent professional development that occurs throughout the year.

- A document called "Standards at a Glance" presents the standards in a summary 5-page form.
- A document called "Unpacking the Standards" identifies fundamental standards for a subject and grade.

Plans are in place to develop other curricular support materials, including:

- A Syllabus for each secondary course in English and Mathematics;
- Unit plans (that may include concept map identifying the skills and concepts that of greatest importance to students who are learning a particular standard and also key assessments and resources – as well, these may include essential questions that pose questions teachers can use to guide the planning of lessons. These later become a focal point for assessments of student learning. As an example, during a study of UAE, what does it mean to be an Emirati? During a study of history, what are the roots of conflict?)

Staff awareness of recently adopted standards is growing. The administration hosted staff gatherings to introduce the Curriculum Content Model. In a survey (25 percent replied) staff generally responded favorably:

- 90% agreed or strongly agreed that we achieve more by collaborating across campuses;
- 80% agreed or strongly agreed that they understood why curriculum improvements are needed;
- 74% agreed or strongly agreed that they know why standards should be common across campuses.

PART X: Gauging Effectiveness and Improvement

Attention turns to how improvement can be measured. Some claim that there are "only three ways to improve performance in school" (see Richard Elmore at http://www.uknow.gse.harvard.edu/leadership)

It is said that "there are only three ways to increase learning and performance. One is to increase teacher knowledge and skill. The other is to affect content. The third is to alter the relationship of the student to the teacher and the content . . . . If you change one of the three, you have to change them all." If true, then school improvement is like a stool that has three legs. A stool must have all three legs to stand. Adopting standards is one step toward improving content. To increase teacher knowledge and skill ENS is seeking and hiring the best available teachers (and then providing the best possible training). Improvement also relies on the commitment of each student to his or her learning. Without that, improvement is not possible.

PART XI: Assessment

While assessment takes many forms, at the Emirates National School it has two functions:

- Enhance learning; and

- Ensure accountability.

Four principles form the basis for the ENS system of assessment:

1. Assessment serves the larger aim of preparing all students for success in college, career, and a global economy.

2. Assessment is balanced. It focuses on achievement and growth toward content standards. It measures end-of-year accomplishment as well as ongoing progress. It relies on a mix of tasks that includes standardized and non-standardized items, direct and in-direct measures, as well as commercially-produced and teacher-created items.

3. The most valuable assessment provides feedback that is meaningful to students, parents, and staff. Assessment identifies where instruction should begin for a student, if learning is on track, and when students have achieved the learning objective. With standards as a reference point, assessments are a guidance system for instruction.

4. Assessment promotes accountability. It clarifies who is responsible to whom and for what. Using data that are comparable student-to-student, class-to-class, school-to-school, and year-to-year, assessment gauges if learning has occurred making it possible to certify the performance of students, classes, programs, schools, and the system.

ENS strives to provide a rounded portrait of student performance. That is generally accomplished through attention to four categories of assessment. That is, assessment is a way to compare achievement to:

- Standards
  Typically thought of as criterion referenced tests this includes the International Baccalaureate Diploma Exam (IB), the Programme for International Student Assessment (PISA), the Trends in International Math and Science Study (TIMSS), Progress in International Reading Literacy Study (PIRLS), the National Assessment of Educational Progress (NAEP), and the Dynamic Indicators of Basic Literacy (DIBELS).

- Past achievement
  Usually characterized as longitudinal growth this includes such tools as Measures of Academic Progress (MAP), Northwest Evaluation Association (NWEA), and the Colorado Student Assessment Program (CSAP).

- Accomplishment of peers
  Commonly referred to as norm referenced tests this includes tools like California Achievement Test (CAT), Comprehensive Test of Basic Skills (CTBS), Iowa Test of Basic Skills (ITBS), and Stanford Achievement Test (SAT).

- Potential
  In the past these were called tests of aptitude or what is now more-commonly called "developed ability." It includes tools like the Wechsler Intelligence Test (WISC, Harcourt), Woodcock-Johnson and Stanford Binet (Riverside), and the Cognitive Achievement Test (CogAT, CTB).

The ENS system is designed with attention to well-established measurement principles. Sound assessment will:
- Be valid for the intended purpose, i.e., assessment measures what it purports to measure;
- Be reliable, i.e., reliable assessment is said to be trustworthy because it generates stable and repeatable results;
- Produce unbiased estimates of achievement, i.e., there is no systematic or unwanted drift in scores;
- Be technically well-constructed, i.e., meets widely-accepted testing standards;
- Ensure that assessment serves learning by providing results quickly enough to be helpful in revising instruction;
- Feature curriculum-embedded items that include teacher-created formative assessments; and
- Include a mix of item types, e.g., constructed response, multiple choice, short answer, long response, simulations.

The ENS system is further designed with local concerns in mind. Thus, assessment is designed to:
- Be aligned with Board-adopted standards as well as curriculum, instruction, and professional development;
- Initially appraise and report on individual-level proficiency and yearly growth toward K12 standards in English/Math;
- Appraise and report on proficiency of groups of students in skill areas as defined by the curriculum content model;
- Be credible in eyes of owners (MOPA/Board), external clients (parents), internal clients (staff), and agencies (ADEC);
- Meet reporting requirements of those that accredit (Advanc*ED*), authorize (IB), and license (Ministry of Education);
- Reflect a commitment to universal design, i.e., all students can access the tests in a meaningful way;
- Be internationally benchmarked so all can see how the system performs against competition that matters;
- Link student and teacher identity making it feasible to appraise performance at the classroom level;
- Take into account that Arabic is typically the mother tongue but English is the language of instruction; and
- Be culturally sensitive.

The approved set of ENS assessments includes:
- NWEA/MAPs
- ITBS (including CogAT)
- PISA (or TIMSS)
- Teacher-created classroom assessment (for the purpose of monitoring ongoing improvement during the year)
- End-of-course exam created by Achieve for Algebra II (implemented only after completion of pilot testing)
- Growth (TBD)
- IB Diploma Exam (as appropriate in the future)

PART XII: Instruction

Certain features characterize ENS classrooms. Effort is made to ensure they are student-centered places where students are actively engaged in learning. With an emphasis on constructivism, attention is given to students deriving meaning from their learning. Questions place a vital role within inquiry-based instruction. Most importantly, instruction is differentiated and not dominated by lecture.

Because proficiency in English is closely related to a student's grasp of concepts within a subject area, careful thought is given to the role English plays in learning. Tightly coupled to this is interest in what is commonly-called "differentiation." This is the process by which teachers adapt content, materials, and instruction according to learning needs, values, and sensitivities of individual learners. In part, professional development will focus on this.

When native language and instructional language differ, students and staff face a special challenge. What expectations apply when Arabic-speaking Emirati students attend schools where English is the instructional language? How much progress can be expected? How should resources be arranged to ensure student success?

Because sound policy should be informed by data, we turn to the research literature. A review highlights the importance of English language proficiency:

a. There is a strong positive relationship between student proficiency on English language development standards on one hand and student proficiency on academic content standards on the other. (WIDA, 2010)
b. Content proficiency follows language proficiency. Attention must first be directed toward the English language needed and used by English language learners to succeed in school before efforts are directed toward the attainment of proficiency in content (T., Shanahan, ed., National Early Literacy Panel report, 2009, cited in presentation on Developing Literacy in Second Language Learners in Denver Colorado, Dec. 18, 2008)
c. Vocabulary knowledge is the single most important area of second language competence when learning content through that language. (V. Collier, "Age and Rate of Acquisition of Second Language for Academic Purposes", 1987, TESOL, Vol 21, No 4)
d. Vocabulary is one of the most important determinants of academic achievement [and] it is the most important skill determining school achievement beyond the third grade. Vocabulary tests provide one of the most reliable measures of academic progress. (M. Saville-Troike, "Teaching and Testing for Academic Achievement: Role of Language Development", Occasional Papers in Bilingual Education, No. 4, 1991)

Research also shows that with proper support native-Arabic speakers perform on a par with native-English speakers.

a. Children in certain social and linguistic contexts need not be taught in their mother tongue in order to achieve literacy norms of the majority language group. (D. Wagner, J. Spratt, and A. Ezzaki , "Does learning to read in a second language always put the child at a disadvantage? Counterevidence from Morocco", in Applied Psycholinguistics, 1989, 10:31-48 Cambridge University Press)
b. It is possible to achieve an authentic, native-like pronunciation of a second language after a specified biological period of time. Certain learner characteristics and learning contexts can work together to override the disadvantages of a late start. (T. Bongaert et al, "Age and Ultimate Attainment in the pronunciation of a foreign language", 1997, Studies in Second Language Acquisition, 19:447-465, Cambridge University Press)
c. [In this study] English was the instructional language. Arabic was spoken at home. Children were administered reading, language, and working memory tests in English and Arabic. The majority were proficient in both languages. Though Arabic and English have different language structures, there is an absence of negative consequences associated with development of language reading skills in both languages. (M. Saville-Troike, "What Really Matters in 2nd Language Learning for Academic Achievement?" TESOL, 1984)

To be known as the premier P-12 program for preparing a nation's future leaders, certain actions are needed.
a. Evaluate student English-language proficiency (this makes it possible to gauge system improvement over time);
b. Adopt standards showing how English language develops (assess, monitor, and report improvement over time);
c. Adopt policy acknowledging that acquisition of cognitive academic English typically precedes content mastery;
d. After training, certify that all teachers know and effectively apply English-as-a-Second Language strategies.

PART XIII: Acknowledgements

Production of this curriculum content model was significantly enhanced by contributions from a variety of individuals. First, a dozen teachers from the National School worked in June 2010 to develop companion guides that accompany this document. These include a grade-by-grade listing of "Standards at a Glance" as well as a document titled "Unpacking the Standards" which links the standard for each grade with the prepared graduate competency for that subject as well as the relevant evidence outcome (these list the proof we would expect to see from students that would demonstrate that students had mastered the standard in question). In addition, the feedback that this team of individuals provided on earlier drafts helped ensure that the curriculum content model included not just a theoretical foundation but also elements that would be immediately useful to classroom teachers. They included:

English

- Ms. Natasha Boukaram (Abu Dhabi City, Girl's School)
- Ms. Mary Mensa Brown (Al Ain, Grade 6)
- Ms. Rachel Harrison (Abu Dhabi City, Primary)
- Mr. Ian Kent (Al Ain, Grade 2)
- Ms. Tanya Nguyen (Al Ain, KG)
- Ms. Louise Parry (Abu Dhabi City, KG-Primary)
- Mr. Brian Rotunno, (Al Ain, Head of Boys School)
- Ms. Minette van der Bijl (MBZ, Girl's School)

Mathematics

- Ms. Heidi Alexander (Al Ain, Grade 5)
- Ms. Lucy Morton (Al Ain, Grade 3)
- Mr. Nic Lee (Abu Dhabi, Primary)
- Ms. Quazanne van der Bijl (Abu Dhabi, Girl's School)
- Mr. Roshan Misthry (MBZ, Boy's School)
- Mr. Ryan Samuel (MBZ, Primary)
- Ms. Sarah Just (Abu Dhabi, KG)

Second, a team that met in June 2010 concerning a revision of the ENS mission and vision. As part of that exercise this group of 40+ provided feedback on earlier drafts of the curriculum content model. Parents of ENS students made up one third of this team. ENS teachers made up another third. ENS administrators rounded out the group. Without their suggestions for midcourse corrections, this document would not be as complete as it is. Too numerous to list, this group was instrumental in helping to ensure that the curriculum content model was properly focused.

Third, ongoing feedback received from school-level administrators helped guide the development of this document and made it stronger and more comprehensive.

Fourth, this project was only made possible because of the leadership, guidance, and support of the ENS board, the Director General, and the School Director.

Lastly, this curriculum content model is intended to be adapted yearly as standards for other subjects are adopted, as new assessments are added, and as new curricular tools come on line. Even now, work is underway to provide teachers with online access to the standards and the companion guides. As well, NWEA testing is being introduced in fall, 2010 (with follow up testing each spring to gauge longitudinal growth). Finally, the addition of wikis and online curriculum mapping tools will help ensure alignment of the printed, taught and tested curriculum and can greatly enhance the ability of teachers to coordinate and share resources and ideas.

Dr. Ken Turner
Head of Curriculum and Instruction
Emirates National School