Morocco

Mohammed Sassi
Said Bouderga
National Center for Evaluation and Examinations

Mohamed Hammani
Teacher Supervisor, Ministry of National Education

Introduction

Overview of Education System

The Ministry of National Education and Vocational Training is Morocco's main official body responsible for providing education to all students at all levels of the public and private education system. The National Charter for Education and Training has recommended that education delivery be decentralized to increase responsiveness to local needs and realities.[1] Accordingly, Academies for Education and Training in each of the 12 newly established administrative regions of Morocco have been charged with implementing the education policy adopted nationally. Regional directorates are in charge of providing services for education in their respective territories and implementing directives set nationally or by the regional academies.

The 2015–2030 national strategic vision was the beginning of the Ministry's "priority measures," which are the foundation of the so-called integrated projects now being implemented.[2] The measures aim to:

- Improve the teaching of languages and reading, especially at the first four grades
- Improve access to schooling in rural and underprivileged areas
- Support students with disabilities
- Support students with learning difficulties
- Improve the quality of learning by renewing standards for teacher training
- Encourage school life activities and school improvement plans
- Improve equity and equal opportunities in the national system of assessment and examinations
- Renew students' orientation and information systems (i.e., for different options by the end of lower secondary and upper secondary school)
- Establish good governance and mobilization around schools
- Capacity-building of teachers, staff, and school leadership nationwide

Morocco's education system is divided into preprimary, primary, secondary, and tertiary education (see Exhibit 1 for more details).

Exhibit 1: Moroccan Education System

Education	School/Level	Grades	Age	Years	Notes
Preprimary	Kindergarten	K1–K2	4–6	2	Preparing for languages, mathematics and common life skills Focusing on basic literacy and numeracy skills (to be generalized in the coming years)
Primary	Primary school	1–6	6– 12	6	Primary school education is compulsory; certificate of primary school awarded on completion
Secondary	Lower secondary	7– 9	12–15	3	Certificate of secondary education awarded on completion
	Higher secondary	10–12	15–18	3	Baccalaureate diploma awarded on completion
Tertiary (superior)	Bachelor's	1–3	18–21	3	Bachelor's (license) degree awarded on completion A 4-year program as of 2020–2021
	Master's		21–24	2 or 3	Master's degree
	Doctorate			3 to 5	Doctoral studies require at least 3 years of research; medical and dental doctorates require more
	Engineering schools		18–22	5	

Use and Impact of TIMSS

The reliable, valid, and detailed data that TIMSS provides about Moroccan student achievement in mathematics and science have been beneficial to education reforms in Morocco. Equally important are TIMSS data on the education environment within which students learn these two subjects at the primary and lower secondary levels. TIMSS' international perspective provides Moroccan educators with deeper insight into ways to improve mathematics and science teaching further.

The National Center for Evaluation and Examinations in collaboration with the Regional Academies of Education and Training organized a number of nationwide seminars. These seminars provided an opportunity to disseminate data on Moroccan student achievement in mathematics and science (as well as reading), and identify the areas and skills needing further attention.

In light of Morocco's TIMSS results, the Ministry of National Education has launched the Evaluation of Prerequisites program to nurture a culture of assessment in mathematics and science, and in particular to diagnose key competencies (and resources) students should master within the new science and mathematics curriculum. The new adapted syllabus for primary schools is an attempt to align with requirements for TIMSS and the Progress in International Reading Literacy Study (PIRLS).

The Mathematics Curriculum in Primary and Lower Secondary Grades

In Morocco, a new primary school curriculum is under development in line with the vision of the National Reform for Education and Training and in compliance with the National Education Emergency Support Program. The curriculum reflects the newly adopted competency based approach, which emphasizes the need to train students to face the challenges of globalization and technological development.[3] Accordingly, as was the case with the 2004 mathematics and science curriculum, the new curriculum draws upon the tenets of the competency- and value-based approaches, as well as the innovative active learning-oriented pedagogical model.[4]

The mathematics curriculum content for the fourth and eighth grades reflects continuity between primary and secondary education, enabling students to strengthen previously learned concepts and skills while developing new ones. Generally, the curriculum enables students to strengthen their mathematical reasoning. Specifically, the fourth grade mathematics curriculum aims to enable students to do the following:[5]

- Enjoy learning through practical activities
- Gain confidence and competence in using numbers and number systems
- Develop problem solving abilities
- Explore shape and space within a range of meaningful contexts
- Develop measuring skills in a range of contexts
- Develop insights into the importance of mathematics in a growing number of occupations and in daily life

The eighth grade mathematics curriculum aims to enable students to do the following:[6]

- Acquire and apply knowledge and skills pertaining to numbers, measurement, space, and statistics necessary for use in everyday mathematical situations
- Acquire mathematical knowledge and skills necessary for further mathematics studies
- Develop the ability to make logical deductions and inductions through problem solving
- Acquire oral and written language skills to communicate mathematical ideas and arguments clearly
- Develop a positive attitude toward, confidence in, and enjoyment of mathematics
- Develop the ability to monitor and evaluate their own progress
- Develop the skills necessary to plan and carry out projects

An adapted version of the mathematics syllabus has been implemented in the first, second, third, and fourth grades of primary schools since last year. Among the main changes in this adapted syllabus are the following:

- Supplementing the program with additional skills, such as analyzing and interpreting data and graphs
- Adding to the program a chapter about fractions
- Linking mathematics problems with problems students encounter in daily life
- More focus on applying inferencing and deduction
- Introducing mobile applications in mathematics and science

Exhibit 2: The Mathematics Curriculum in Primary and Lower Secondary Grades[7]

Grades	Units	Lessons
Primary	I. Numbers and arithmetic	▪ Numbers from 0 to 999,999 ▪ Calculation of natural integers ▪ Addition, subtraction, multiplication, division ▪ Mental and rapid arithmetic ▪ Proportionality ▪ The concept of division ▪ Decimal numbers ▪ Calculations on decimal numbers
	II. Measurement	▪ Measurement of lengths and masses ▪ Capacity ▪ The meter, kilogram, and liter and their multiples and parts ▪ Measuring areas: square meters, parts, and multiples ▪ Time: days, hours, and periods ▪ Money
	III. Engineering and space	▪ Basic geometric shapes ▪ Engineering constructions ▪ Parallelism and orthogonality ▪ Parallelograms, rectangles ▪ Axial symmetry and axis symmetry shape ▪ Shifting, enlarging, and reducing shapes ▪ Solids
Lower Secondary	I. Numeric activities	▪ The numerical sets N, Z, Q, R ▪ The four operations on these sets ▪ Equations and inequations ▪ Numeric powers ▪ Order and operations ▪ Two-equations systems
	II. Geometric activities	▪ Fundamental concepts ▪ Triangles ▪ Lines in a triangle ▪ Transformations in a plan

Grades	Units	Lessons
		▪ Trigonometry ▪ Circle ▪ Vectors ▪ Thales theorem ▪ The Pythagorean theorem ▪ Geometry in the space ▪ Volume calculations ▪ Isometric triangles ▪ Similar triangles ▪ Analytic geometry
	III. Graphics and Statistics	▪ Number lines ▪ Coordinates ▪ Proportionality ▪ Statistics ▪ Linear and affine functions

The Science Curriculum in Primary and Lower Secondary Grades

Morocco's 2004 curriculum draws upon the tenets of competency and value based approaches, as well as the innovative active learning-oriented pedagogical model. The science curriculum content for the fourth and eighth grades reflects continuity between primary and secondary education, enabling students to strengthen previously learned concepts and skills while developing new ones.

The goals of the fourth grade science curriculum are as follows:[8]

- Build upon interest in and stimulate curiosity about our environment through high quality science learning experiences
- Gain deeper personal insights into the natural world and in turn aesthetic appreciation of it
- Develop skills, attitudes, and values related to scientific inquiry
- Develop the ability to use scientific knowledge and methods in making personal decisions
- Develop full understanding of the influence of science and technology on our environment and lives

The eighth grade science curriculum is designed to enable students to gain awareness and understanding of the skills needed in science.[9] The distinguishing feature of the syllabus for this grade is that it focuses equally on the acquisition of scientific knowledge and thinking processes.

There was a recent change in the units covered in the lower secondary grades to change the order of the content to the following: physics, life sciences, Earth and space sciences, and technology.

Exhibit 3: The Science Curriculum in Primary and Lower Secondary Grades

Grades	Units	Lessons
Primary	I. Gases	▪ Air ▪ Other gases ▪ Common properties of gases
	II. Nutrition	▪ Meals ▪ Introduction to the digestion process ▪ The concept of the digestive tube
	III. Heat	▪ Heat exchange ▪ Dilatation
	IV. Status changes	▪ From solid to liquid ▪ From liquid to gas
	V. Life cycle	▪ Life cycle of a plant ▪ Animal life cycle (insect breeding)
	VI. Classification of animals	▪ Classification of vertebrate animals
	VII. Plants	▪ Development of a flower to a fruit
	VIII. Water and nature	▪ The use of water by humans ▪ Water pollution ▪ Awareness of the importance of water conservation ▪ Learn about living things in nature
	IX. Electricity	▪ Simple circuits ▪ Simple circuit elements ▪ Simple circuit installation ▪ Simple circuit representation ▪ Installation in series ▪ Installation in parallel
Lower Secondary	Life and Earth Sciences	▪ Plate tectonics theory ▪ Relationship between the theory of plate tectonics and internal geological phenomena ▪ Animal reproduction ▪ Plants: sexual reproduction ▪ Plants: asexual reproduction ▪ Human reproduction ▪ Heredity in humans
	Physics and Chemistry	▪ The air around us ▪ Matter and environment ▪ Properties of air and its constituents ▪ Molecules and atoms ▪ Chemical reactions ▪ Natural and synthetic materials ▪ Air pollution ▪ The light that surrounds us ▪ Light and images ▪ Light sources and receptors ▪ Light and colors: light scattering

Grades	Units	Lessons
		▪ Light propagation ▪ Applications of rectilinear light propagation ▪ Thin lenses ▪ Applications: study of some optical devices ▪ The sinusoidal alternating electric current ▪ Domestic electrical installation

Professional Development Requirements and Programs

The National Charter for Education and Training prioritizes professional development for teachers and school administrators.[10] Pedagogical inspectors play an important role in the education system in Morocco. Among other endeavors, they design teacher professional development programs, colloquia, and seminars, and they supervise teachers to further improve teaching and learning within the 12 regional academies for education and training across the country.

Monitoring Student Progress in Mathematics and Science

The Ministry of National Education in Morocco has implemented policies that require students to pass exit examinations at each level of education to obtain a leaving certificate and continue to the next level. However, at the primary school level, students are promoted automatically from one grade to the next. Therefore, dropout rates have declined over the last 15 years, particularly for primary school students.

At each education cycle, the following exit examinations are administered:

- Primary school exit examination—This examination is administered in all 12 regions of Morocco and developed by a commission of experienced teachers from the Academies for Education and Training and inspectors. Students are required to pass this examination to be eligible for admission to lower secondary school.
- Lower secondary school exit examination—This examination also is administered in all 12 regions of Morocco and developed by a commission of experienced teachers from the Academies for Education and Training and inspectors. Successful students are awarded a leaving certificate and are eligible for enrollment in upper secondary schools.
- The baccalaureate examination—This national achievement examination was developed at the National Center for Examinations. The examination takes three or four days to complete and covers the content and objectives outlined in the syllabi for upper secondary education. The content of the examination depends on the specific coursework taken by students. Some subjects are tested through school assessment at the end of the first or second year of baccalaureate education or through the regional examination administered in the second semester of the first year of baccalaureate education. Students who achieve an overall average of 10 or higher on a 20-point scale are awarded a baccalaureate diploma.

Formative assessment is an important source of feedback for teachers and is geared toward helping them gauge the effectiveness of their teaching strategies in relation to the curriculum, as well as to orient their teaching style to student learning styles. Teachers use formative assessment aligned with ministerial circulars and pedagogical guidelines as a source of information about student progress and ability.[11] Formative assessments are curriculum-based tests of student competencies that provide opportunities for remediation.[12]

The 1999 Charter for Education and Training stipulated that Morocco's assessment and certification system should be overhauled. In response, the National Center for Evaluation and Examinations has led significant reform of the assessment and certification system. To ensure uniformity and standardization in the evaluation process, the center developed frameworks and procedures for the design, administration, and scoring of examination papers. Moreover, in collaboration with the Higher Council for Education, the center launched the National Program for the Evaluation of Acquired Learning Outcomes (*Programme National d'Evaluation des Acquis*, or *PNEA*) to implement a periodic assessment of student learning. The *PNEA* nationwide system of assessment makes it possible to gauge whether learning outcomes have been met, and to define a benchmark against which to evaluate systematically the quality of education being provided. The executive summary of *PNEA* 2008 includes recommendations to improve the teaching and learning of languages, mathematics, and science.

Special Initiatives in Mathematics and Science Education

Lessons from Morocco's participation in PIRLS and TIMSS and in national assessments have triggered deep reflection about how to improve students' basic skills and knowledge, particularly in reading, writing, mathematics, and science. The Higher Council for Education, Training, and Scientific Research has identified a wide apparent disparity in student performance between urban and rural areas. To tackle these issues, education reform is underway in accordance with the Strategic Vision of the Reform (2015–2030). This vision puts schools at the heart of greater social reform.

In this context, many pathways to improving student skills and knowledge have been considered. Among the most important measures taken to improve the quality of education in Morocco is the revision and improvement of the national curriculum in the first four years of primary school, introducing greater emphasis on reading, writing, scientific awareness, and mathematics. Revisions of the national curriculum also target changes in:

- The roles played by teachers and students
- The methodologies and approaches used
- Assessment and examinations
- Teacher training and classroom equipment

The newly revised curriculum was trialed during the 2014–2015 school year in 10 percent of schools across Morocco. Results are being analyzed and will be communicated to all stakeholders so that they can decide whether to generalize the use of the revised curriculum.

The government of Morocco has agreed with Japan to work together to implement another initiative called Promoting Education with Equity and Quality (PEEQ). PEEQ comprises two components: an equity component that addresses the issue of equitable access to education for both boys and girls, and a quality component focused on improving the quality of learning of mathematics and science. The quality component of PEEQ is most relevant to the teaching and assessment of mathematics and science.

The Moroccan education system caters also for special cases of students.[13] High-achieving students are offered the opportunity to participate in the national and international Olympiads in mathematics and sciences. They are also offered financial support to continue their higher studies especially if they come from disadvantaged areas. A national support program was implemented recently for the benefit of low-achieving students. The program is offered in schools' extra sessions to support learning and cater to any difficulties students have regarding school subjects.

Special interest is given to students with special physical or mental needs. There is a shift now from enrolling them in special classes with special programs to integrating them into mainstream classes and sensitizing teachers to better ways to educate them. The National Center for Assessment and Examinations has made great efforts to adapt the exams to these students' learning styles.

Contributors

Ahmed Sarghini, Physics teacher-supervisor, secondary education; Fatima Konia, Life and Earth Sciences teacher-supervisor, secondary education; Abdenbi El Harrak, teacher-supervisor, primary education; Abdesslam Hakkani, Mathematics teacher-supervisor, secondary education; Abdelghani Slimani, teacher-supervisor, primary education.

Suggested Readings

Ministry of National Education and Vocational Training. (2015). التوجهات الاستراتيجية والتدابير ذات الأولوية [Strategic directives and priority measures]. Retrieved from http://www.men.gov.ma/default.aspx

Ministry of National Education, Higher Education, Staff Training and Scientific Research. (2009). *Le rapport de synthèse du programme d'urgence 2009–2012* [The synthesis report of the education emergency support program 2009–2012]. Bab Rouah: Author.

Conseil Supérieur de l'Education, de la Formation et de la recherche. (2015). *Pour une ecole de l'equité, la qualité et de la promotion: Vision strategique de la réforme 2015–2030* [For a school with equity, quality and promotion: The strategic vision of reform (2015–2030)]. Retrieved from http://www.csefrs.ma/pdf/Vision_VF_Fr.pdf

References

1 الرافعة رقم 15 الميثاق الوطني للتربية والتكوين [The national charter for education and training "lever 15"]. (1999). Retrieved from http://www.coimbra-group.eu/tempus/Docs/charte_fr.pdf

2 Ministry of National Education and Vocational Training. (2015). التوجهات الاستراتيجية والتدابير ذات الأولوية [Strategic directives and priority measures]. Retrieved from http://www.men.gov.ma/default.aspx

3 Ministry of National Education, Higher Education, Staff Training and Scientific Research. (2009). *Primary school competencies guide* (1st ed.). Bab Rouah: Author, p. 2-15.

4 Ministry of National Education, Higher Education, Staff Training and Scientific Research. (2009*). Primary school pedagogical guide* (2nd ed.). Bab Rouah: Author, p. 114-119.

5 Ministry of National Education, Higher Education, Staff Training and Scientific Research. (2002). *Le livre blanc* [The white paper]. Retrieved from http://www.men.gov.ma

6 Directorate of Curricula, Ministry of National Education, Higher Education, Staff Training and Scientific Research. (2010). *Lower secondary school pedagogical guidelines*. Retrieved from http://www.men.gov.ma

7 Ministry of National Education, Higher Education, Staff Training and Scientific Research. (2002). *Le livre blanc* [The white paper]. Retrieved from http://www.men.gov.ma

8 Ministry of National Education, Higher Education, Staff Training and Scientific Research. (2009). الطبعة 2009 الدليل البيداغوجي للتعليم الإبتدائي2[Primary school pedagogical guide (2nd ed.).]. Bab Rouah: Author, p. 120-121.

9 Directorate of Curricula, Ministry of National Education, Higher Education, Staff Training and Scientific Research. (2010). التوجيهات والبرامج التربوية للتعليم الإعدادي [Lower secondary school pedagogical guidelines]. Retrieved from http://www.men.gov.ma

10 الرافعة رقم 15 الميثاق الوطني للتربية والتكوين [The national charter for education and training "lever 15"]. (1999). Retrieved from http://www.coimbra-group.eu/tempus/Docs/charte_fr.pdf

11 Ministry of National Education, Higher Education, Staff Training and Scientific Research. (n.d.). *Organizing and monitoring the implementation of continuous assessment–Ministerial circular number 179.* Retrieved from http://www.men.gov.ma

12 Ministry of National Education, Higher Education, Staff Training and Scientific Research. (n.d.). *The pedagogical guidelines for science and science test specifications applied in primary and lower secondary schools.* Bab Rouah: Author. Retrieved from http://www.men.gov.ma

13 Conseil Supérieur de l'Education, de la Formation et de la recherche Scientific. (2015). *Pour une ecole de l'equité, la qualité et de la promotion: Vision stratégique de la réforme 2015–2030* [For a school with equity, quality and promotion: The strategic vision of reform (2015–2030)]. Retrieved from https://www.csefrs.ma/wp-content/uploads/2017/09/Vision_VF_Fr_-Resume.pdf