Saudi Arabia

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Introduction

Overview of Education System

The Kingdom of Saudi Arabia aims to prepare future generations to be good and productive citizens who can meet the aspirations of the Kingdom's Vision 2030 initiative. One part of the initiative is the Human Capability Development Program (HCPD), which aims to

> "[i]mprove the outputs of the education and training system at all stages from early education to continuous education and provide training to reach the international levels through education, rehabilitation and training programs that keep abreast of modern times and requirements and are in line with the needs of development and the local and global labor market in partnership with all relevant parties locally and internationally. The program also contributes to the development of all components of the education and training system, including teachers, trainers, faculty members, governance, evaluation systems, quality, curricula, educational and vocational paths, and training environment for all stages of education and training to cope with modern and innovative trends in the fields of education and training. The program will be based on the Islamic, educational, social and professional foundations. It will introduce new educational and training policies and systems that will enhance the efficiency of human capital in line with the Kingdom Vision 2030 to achieve comprehensiveness, quality, flexibility and serve all segments of the society to promote the Kingdom's regional leadership and international competitiveness."[1]

Since the establishment of the Kingdom of Saudi Arabia in 1932, the education system has developed rapidly, especially in recent decades. Although the literacy rate was very low at one time, in 2017, it reached 99.3% among those ages 15 to 24 and 95.3% among those 15 years and older.[a] The education structure is based on a 6-3-3 ladder (6 years of primary education, 3 years of intermediate education, and 3 years of secondary education), with compulsory education ending at the end of the lower secondary stage. Preprimary education is not mandatory; however, the Ministry of Education (MOE) has been working very hard to achieve its goal of reaching a 40% enrollment rate by 2025. In 2021, the MOE implemented

a See https://www.globaldata.com/data-insights/macroeconomic/literacy-rate-in-saudi-arabia/, https://database.stats.gov.sa/home/report/178, and https://countryeconomy.com/demography/literacy-rate/saudi-arabia?year=2018 for more information.

several initiatives to improve the education system, including introducing several new subjects (e.g., critical thinking, digital skills, life skills, English as a second language starting in first grade), and one of the most promising transformations is offering multiple learning pathways for students to choose from at the upper secondary stage.

Saudi Arabia is experiencing rapid changes in all sectors, including education, due to its Vision 2030 initiatives. In 2021, the Saudi government launched the HCDP, which aims to develop a resilient and strong education base for everyone by focusing on making high-quality education accessible to all. To fulfill this aim, the MOE intends to achieve the following goals:[2]

- promote values and national belonging
- improve learning outcomes and the education system's position globally
- develop the education system to meet the requirements and needs of the labor market
- develop the capabilities of the education cadres
- enhance community participation in teaching and learning
- ensure education for all and promote lifelong learning opportunities
- empower the private and nonprofit sectors and increase their participation to improve the financial efficiency of the education sector
- raise the quality and effectiveness of scientific research and innovation
- develop the university system and educational and training institutions[3]

By achieving these goals, teachers will be inspired to deliver innovative learning experiences through innovative teaching strategies and with effective use of technology (e.g., blended learning and online learning). To acquire intended skills and to develop values, students are given opportunities to participate in a variety of extracurricular and community-based activities. Since teachers are key players in achieving these goals, they are provided with more diverse career paths to gain relevant experience, in addition to quality professional development programs that improve their competency. Benefiting from research, including international test studies, the MOE has been working on improving the education system with special focus on improving learning outcomes and closing the regional gap through several initiatives.

In addition, one of the major changes is extending the learning cycle period; in 2021, the two-semester school system was converted into a three-semester system with short vacations in order to keep pace with international best practices.

While the Saudi Arabian education system is predominantly centralized, efforts toward decentralization are being made to empower local communities. Programs like the Education Development Project delegate decision-making authority to local education departments and school principals, promoting community participation. However, final authority and control still lie with the MOE.

The MOE in Saudi Arabia is responsible for making education decisions and managing the education system. It consists of various departments that work together to formulate policies

and ensure the quality of education. The General Directorate of Education is also involved in making regional-level decisions and oversees policy implementation.

General education in Saudi Arabia is divided into public (government-funded) education, private education, special education (under the supervision of the MOE), vocational education (related to the Technical and Vocational Training Corporation), and foreign education.

There are also many specialized training institutes under the supervision of different departments, such as the Ministry of Health. There are 30 universities (six of which are private) in addition to many colleges offering varied courses of study. Compulsory education in Saudi Arabia is for all children ages 6 to 15. Saudi Arabia's public education system is organized according to the following structure:

- kindergarten—This level spans 3 years (ages 4 to 6) and is optional.
- primary education—This level spans 6 years and covers Grades 1 to 6.
- intermediate education—This level spans 3 years and covers Grades 7 to 9.
- secondary education—This level spans 3 years and covers Grades 10 to 12.

Saudi Arabia has different types of schools that offer varying curricula in mathematics and science education. Public schools follow a standardized curriculum aligned with national standards. International schools integrate international perspectives and may have different content emphasis. Religious schools focus on religious education but still teach mathematics and science. Student assignments and assessment criteria can differ among these schools. Public schools follow national standards, international schools may have international assessments, and religious schools emphasize religious texts. The main differences in curricula stem from content emphasis, teaching methods, and education philosophies. Public schools provide comprehensive education, international schools offer broader electives, and madrassas prioritize religious education. Variations may exist at individual school levels.

Use and Impact of TIMSS

Saudi Arabia has been participating in the TIMSS assessment since 2003. This participation has provided valuable insights into Saudi Arabia's education system and has influenced policies and reforms.

TIMSS results are used to benchmark Saudi Arabia's education performance, identify areas for improvement, and evaluate existing policies and programs. The data have guided decision-makers in addressing curriculum gaps, aligning with international standards, and introducing new initiatives. Additionally, TIMSS results have emphasized the importance of enhancing teacher training and professional development to improve the quality of education. They have also contributed to discussions on education equity and the inclusion of underrepresented groups in science, technology, engineering, and mathematics (STEM) education.[4]

The Mathematics Curriculum in Primary and Lower Secondary Grades

The authorized mathematics curriculum in Saudi Arabia is similar to curricula published by McGraw Hill. These curricula are based upon balanced learning and rely on vertical interdependence among the curricula established for the various grades to develop cognitive understanding and mathematical skills for all grades. Specifically, this approach depends upon the following:

- examining concepts and building cognitive skills
- developing mathematical skills and ways of mastering them
- applying mathematics logically to solve problems from daily life

Fourth-Grade Mathematics Curriculum

In the fourth year of primary education (Grade 4), mathematics textbooks consist of 12 chapters divided equally among the three semesters. Their content is related to five domains—Number, Algebra, Measurement, Geometry, and Statistics—and content discussed within these domains include the following:

- Number—whole numbers and comparisons of whole numbers, place value up to 1 million, the concept of fractions, equivalent fractions (comparing, ordering, and placing them on a number line), and categorizing fractions (rational, irrational, and decimal)
- Algebra—defining and explaining patterns of multiplication and division, properties of addition and multiplication, basics of subtraction and division, and algebraic representations of number sentences
- Measurement—units of length, area, volume, and mass; time intervals; and perimeter and area of squares
- Geometry—categorizing and describing solids, geometric concepts of lines (e.g., parallelism and perpendicularity), angles and types of angles, polygons (e.g., triangles and congruence), and locating numbers and fractions on a number line and a coordinate plane
- Statistics—data collection, organization, and representation (points, columns); creating bar graphs; reading and explaining data; and finding median and mode

Eighth-Grade Mathematics Curriculum

In the second year of intermediate education (Grade 8), mathematics textbooks consist of 10 chapters evenly divided among the three semesters, and they cover five domains similar to the primary education mathematics domains: Number, Algebra, Measurement, Geometry, and Statistics and Probabilities. Content discussed includes the following:

- Number—proportionality; rate of change; scale; percentage and its applications; whole numbers, integers, and rational and irrational numbers; and square roots
- Algebra—arithmetic progression, simplifying algebraic expressions, algebraic transformations, solving linear equations and inequalities, functions and their applications, and slope
- Measurement—perimeter and area of a circle; and surface area and volume of prisms, pyramids, and cylinders
- Geometry—the Pythagorean theorem, identification of polygons, the relationship between lines and angles, plotting points on a coordinate plane and the distance between two points in the plane, and geometric transformations of figures (e.g., symmetry across a line or around a point, translations, and scale changes)
- Statistics and Probabilities—histograms; pie charts; measures of central tendency; range; data analysis, its interpretation and presentation; and measures of dispersion

The Science Curriculum in Primary and Lower Secondary Grades

The officially authorized science curriculum in Saudi Arabia is organized around texts designed to position the student centrally in the teaching and learning process. Various activities are designed for recursive learning and allow students to participate at all levels. The overall philosophy of science textbooks emphasizes the importance of the scientific method of investigation, practical skills (e.g., scientific reading and writing, drawing, and collecting samples), and connecting science knowledge with daily life (e.g., relating science to mathematics and society).

Fourth-Grade Science Curriculum

In the fourth year of primary education (Grade 4), science textbooks include the following topics:

- living creatures, cells, classification, plants, animals (vertebrates and mollusks), and animal conservation
- environmental systems
- earth, water, and minerals
- space and the solar system
- substances and their changes (how the material changes)
- power and energy (powers and movement, movement change, heat, electricity, magnetism)

Eighth-Grade Science Curriculum

In the second year of intermediate education (Grade 8), science textbooks include the following:

- biology—skin and muscles; the structural and nervous system; endocrine and reproductive organs; stages of human life; the human body: the immune, digestive,

and respiratory systems; body motion; seed and seedless plants; environment resources; pollution and environmental protection
- chemistry—temperature, heat transfer, solutions and solubility, acidic and basic solutions, materials, heat and material transformations
- physics—waves, sound waves, light, fluid behavior, engines and refrigerators, energy transformations

Teacher Professional Development Requirements and Programs

Professional Development Requirements

In 2020, the government released The Educational Job List,[5] which is considered an important shift in the process of developing education in Saudi Arabia through its contribution to the transformation of the teacher's job into a professional career. The aim is to "professionalize education," as the teacher is one of the pillars of the development of the education sector in the Kingdom.

The MOE aims to develop teacher job performance levels, secure teaching positions for those with contract renewals, and equally and fairly assign and transfer teachers; moreover, the MOE, in cooperation with the Education & Training Evaluation Commission, has implemented a new system for teacher licensure to clarify the status of teacher positions and to ensure improvements in teacher performance.

All teachers of the first year in intermediate education (Grade 7) and beyond have specialization in mathematics and science, as do most fourth-grade primary education teachers. Some teachers who are well qualified, have considerable teaching experience, and have participated in a significant amount of professional development courses are allowed to teach mathematics and science provisionally even if they do not have a minor degree in these subjects. In the future, these teachers will be replaced gradually by academically qualified specialist degree holders.

Ongoing Professional Development Programs

Currently, one project in progress is Professional Development of Teachers,[6] which aims to improve professional performance according to teacher professional standards through improving education products, offering diversified specialized programs according to the needs of continual professional development programs, and raising the standard of scientific and professional qualifications of education staff. All of this would be made possible through investing in the MOE's distance learning and modern technical applications.

In addition, the MOE cooperates with institutions of higher education to develop additional standards for new teachers, some of which include the following:

- preparing standards for general teacher education levels in cooperation with colleges of education and teachers' colleges, guided by international standards applied to every subject for all levels of the general curriculum

- preparing professional development programs for teachers based on education and professional standards
- reviewing the courses of study of colleges of education and teachers' colleges to ensure they meet the requirements of the new curricula

What the MOE hopes to get from this collaboration is the following:

- ensuring that colleges of education and teachers' colleges are able to fulfill the Kingdom's future needs for teachers in all fields
- coordinating with international recommendation committees to develop a set of recommendations for colleges of education nationally and internationally, and urging universities to fulfill academic recommendations
- developing colleges of education and teachers' colleges using best standards and practices and through cooperation with distinguished international colleges and universities

Teachers receive professional development and supervision throughout their careers in a number of ways. For example, computerized supervision allows for rapid idea exchange and information access that helps to develop teacher knowledge, teaching environments, and quality teaching outputs. Presently, the MOE is launching an electronic gateway called FutureX is considered a shift toward digital education for communication within the education sector to contribute to knowledge building and to assist teachers in publishing education research. Students can learn in a new education environment that depends on technology to deliver knowledge and increase scientific outcomes. It supports the development of the scientific and pedagogical capacities of teachers.[b] Additionally, a new project known as Teach Me How to Learn aims to develop teaching strategies and techniques for use in and out of the classroom.

The MOE is also preparing a project for teacher assessment to improve practical and educational outputs to build knowledge. Another program aims to implement changes to educational programs based on analyses of teacher evaluations and education trends.

Special Initiatives in Mathematics and Science Education

Mathematics laboratories, visual aids, and computer laboratories are found in most of the Kingdom's schools. There are also supplemental materials, such as geometric figures, teaching aids, and illustrated textbooks with accompanying exercise books. In addition, there are guidebooks, teacher's manuals, flash cards, posters, and computer software specifically prepared for teachers.

The mathematics and science books contain a barcode for each lesson with which students can connect to various electronic links to several lessons or parts of a lesson. The links could include a video explaining the lesson or part of it, manuals used in some lessons, and various

b See https://futurex.nelc.gov.sa/en/front for more information.

tests a student can use for self-evaluation. The MOE has also launched 12 video channels that students can use to access free educational content.[7]

Computers are used and students are sometimes asked to visit certain websites during their lessons. Computer use as a formal subject is introduced in Grade 4 in public schools but is practiced as an extracurricular activity in all grades. In private schools, computer use starts as a formal subject in Grade 1.

Suggested Reading

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