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Global Integration of AI Education

This is the third part of our series on how countries are teaching students of all ages how AI works. The first two looked at how the USA and China were tackling this subject and here we look at the subject globally

Artificial Intelligence (AI) is gradually finding a formal place in school curricula around the world, though progress is uneven. As of late 2022, UNESCO's global survey found only 11 countries had developed and officially endorsed K-12 AI curricula (with a few more in development) . By 2025, more governments have launched initiatives to teach AI in primary and secondary schools. Below is an overview by region, highlighting when AI education begins, how it's integrated, what content is covered, key policies, and teacher training efforts. Common content themes include algorithms & programming, data literacy, problem-solving, ethics and societal impact of AI, and basic machine learning concepts . The table below summarizes several national AI curriculum initiatives for quick comparison:

Country	Grades Introduced	Curriculum Approach	Content Focus
China	Primary through High School	Integrated into ICT curriculum (mandatory)	AI fundamentals, practical applications (e.g. computer vision), basic ML concepts, tech-agnostic approach
India	Middle/Secondary (grade 6+; elective from 9)	Elective AI subject in secondary; cross-curricular integration in middle school	Project-based AI foundations (intro to AI domains), coding (Python), applied AI projects, ethics
South Korea	High School (grades 10–12 initially)	Two elective AI courses in high school; expanding into K-9 by 2025 (within math/technology subjects)	"Intro to AI" and "Mathematics for AI" cover AI concepts, algorithms, and math foundations; programming, usage and AI ethics included in younger grades
United Arab Emirates	Kindergarten through Grade 12	AI content integrated into a core Computing/Design subject (mandatory across K–12)	Age-tailored: stories & games introduce AI in early grades; older students tackle real-world AI applications, ethical challenges, data literacy, algorithms, and innovative projects
Saudi Arabia	High School (Grade 12)	New "Introduction to AI" elective course for general track high-schoolers (launched 2025)	Foundational AI knowledge, real-world applications, project-based learning via a digital platform (mix of theory and practice)
Qatar	Middle & High School	Updated Computing/IT curriculum with two tracks (general & "High Tech") in secondary education	Core computing curriculum (mandatory) introduces coding and basic AI; advanced "High Tech" track includes deeper AI and emerging tech topics (machine learning, etc.) in upper grades

Kuwait	Primary & Middle School	National “Standards” curriculum for ICT updated to include AI concepts (mandatory)	Basic understanding of AI and its uses introduced in early grades; further computing and robotics content in middle school
Jordan	Upper Primary & Secondary (Grades 7, 9, 11)	“Digital Skills” subject revised nationally to add programming & AI modules in key grades	New textbooks (Grades 1–12) cover IoT, AI, cloud computing, and Python programming – building critical thinking, creativity, and problem-solving alongside tech skills
Austria	Upper Secondary (High School)	Specialized curriculum track in informatics (nationally mandated in 2018)	Data Science and AI – covers core AI concepts, data handling, algorithms, and societal implications (part of digital skills modernization policy)
Portugal	Primary through High School	Integrated into ICT curriculum across K–12 (mandatory)	Computational thinking, basic AI concepts (at age-appropriate depth), data literacy, and coding introduced progressively; ethical and societal context in later grades
Belgium (Wallonia)	Lower & Upper Secondary	New IT curriculum standards (community-level mandate) – schools develop their own materials within set competencies	Emphasis on algorithmic thinking, understanding AI basics (as part of digital literacy); schools in French-speaking Community include AI topics within a broader “IT Repository” framework

Table: Selected government-supported K-12 AI education initiatives around the world (sources: UNESCO survey data and national announcements).

Asia-Pacific

China

China has been an early mover in K-12 AI education. In 2018, the central government announced plans to include AI courses in primary and secondary schools, publishing the first high school AI textbook Fundamentals of Artificial Intelligence . Initially piloted in 40 high schools , AI content is now embedded in the national Information Technology curriculum across all levels . Students start with basic concepts in primary grades and progress to more advanced AI theory and programming by high school. The curriculum covers the history and fundamentals of AI, practical applications like facial recognition and autonomous driving, and basic machine-learning principles . China's approach is platform-agnostic, emphasizing core principles over specific tools . Notably, China's AI curriculum is rigorous – one review found its high school AI requirements exceed those of other science subjects . Government Policy: This push aligns with China's National AI Development Plan (2017) to build AI talent. The Ministry of Education worked with universities and companies (e.g. SenseTime for textbooks) to roll out AI education. Teacher Training & Resources: The government has engaged teachers, academics, and tech experts in curriculum design . Large-scale teacher training is ongoing to ensure educators can teach new AI content, though keeping teaching skills up-to-date remains a challenge given the fast-evolving tech.

India

India’s central board of education (CBSE) introduced AI as an optional subject at secondary level in 2019 . Initially offered in Class 9 (around age 14), it has since expanded, with some schools also introducing it in Class 8 or 11 based on interest . CBSE’s AI curriculum is project-driven (“learning through doing”) and interdisciplinary. It teaches students the basics of AI concepts, machine learning, and coding (Python), and how to apply AI to solve local problems . There’s also emphasis on ethics and AI for social good. In addition to the elective course, CBSE recommended a “multidisciplinary approach” to integrate AI themes across subjects for grades 6–10 . Government Initiatives: India’s National Education Policy encourages digital skills, and NITI Aayog’s Atal Innovation Mission developed Atal Tinkering Labs (ATL) to expose younger students (middle school) to AI through hands-on modules . Teacher Training: To support rollout, CBSE partnered with industry (IBM, Intel, Microsoft) to train teachers in AI . Thousands of teachers have undergone workshops and “train-the-trainer” programs since 2019 . Despite these efforts, adoption varies – urban schools lead in offering AI, while others face resource and timetable constraints . The government continues to update teacher training frameworks and provide teaching materials to standardize AI education quality .

South Korea

South Korea formally integrated AI into its high school curriculum in 2021 as part of a national strategy. Two new career-elective courses were introduced for grades 10–12: “Introduction to AI” and “Mathematics of AI” . These courses cover fundamental AI concepts, algorithms, and the mathematics underpinning AI, preparing students for AI-related fields. Meanwhile, the Ministry of Education announced

that basic AI principles, usage, and ethics would be incorporated into elementary and middle school curricula by 2025 . For younger students, this means learning simple programming and understanding how AI is used in everyday life (with age-appropriate ethical discussions about AI's limitations and risks). Government Policies: South Korea's National AI Strategy (2019) explicitly calls for AI education to boost workforce competitiveness . The government, through KOFAC, developed AI curriculum content and is updating national ICT textbooks to include AI. Teacher Training: A major teacher upskilling effort is underway – about 5,000 teachers are to be trained in AI education by 2025 under government programs . Universities have been tasked with re-training in-service teachers in AI, and new teacher certification standards now include AI competencies. Additionally, Korean schools are piloting AI-assisted teaching tools, but the policy emphasizes a teacher-led approach to using AI in classrooms (teachers receive guidance on using AI platforms to personalize learning while maintaining pedagogical control) .

Japan

Japan has not introduced a dedicated K-12 AI course, but it has taken steps to integrate AI awareness into the curriculum and school policies. In 2023, the Ministry of Education (MEXT) released new guidelines emphasizing AI literacy for students . These guidelines urge schools to teach students "the characteristics of AI, including its advantages and disadvantages," and responsible use of AI tools . For example, students learn why they shouldn't present AI-generated work (like essays from ChatGPT) as their own . The curriculum in subjects such as ICT, math, and social studies is being updated to include discussions on AI's impact on society (aligned with Japan's Society 5.0 vision). Some high school textbooks (across subjects like technology and ethics) now contain sections on generative AI and

data science . Government Initiatives: MEXT’s focus is on broad digital education; since 2020, programming is compulsory in elementary schools, forming a base for later understanding of AI. By 2024, the government also issued provisional guidelines allowing limited use of generative AI in classrooms, along with warnings about privacy and copyright . Teacher Preparedness: Japan is developing teacher training resources on AI – including how teachers can use AI tools for lesson planning and how to educate students about AI. However, the approach is cautious: current training emphasizes understanding AI’s benefits and risks rather than technical implementation. This means Japanese teachers are guided on facilitating class discussions about AI ethics and on supervising students’ use of AI (e.g. for language learning) .

Other Asia-Pacific Notes

Several other Asia-Pacific education systems are exploring AI education. Singapore, for instance, has robust computing and STEM programs but as of 2022 had no separate AI curriculum in primary/secondary (AI topics are addressed through enrichment programs and ICT classes) . Armenia provides an example in Central Asia: its government updated the national ICT curriculum to include basic AI concepts, implemented in upper primary and middle school grades . Bangladesh, Indonesia, and others are at early stages, focusing first on general digital literacy and coding, with AI likely to be introduced in coming years. Overall, Asia-Pacific ministries often tie AI curriculum plans to national tech strategies, aiming to nurture future-ready skills.

Europe

European countries have largely approached AI education as an extension of computing or digital skills curricula, with a few launching dedicated modules:

United Kingdom

On 9th June 2025, the UK Government announced TechFirst, a nationwide skills programme built to bring artificial intelligence lessons into every secondary school.

Downing Street confirmed the plan carries £187 million in public money and will run for three years.

TechFirst promises a new online hub, local delivery partners in each region, and live sessions that explain coding, cyber security and data science in clear language.

The UK's national curriculum (since 2014) emphasizes computing fundamentals (coding, algorithms, data). While it doesn't explicitly mandate AI coursework at the primary/secondary level, concepts that underpin AI (like algorithms, logic, data representation) are covered. In recent years, there have been calls to strengthen AI education – for example, introducing machine learning examples in GCSE/A-level Computer Science and discussing AI ethics in ICT classes. Some UK schools and exam boards have begun offering AI-related content (such as AI project coursework or optional units on robotics), supported by government-funded initiatives like the AI National Centre for Computing Education resources. However, no separate compulsory AI course exists yet nationally. Policy Initiatives: The UK government's AI Strategy (2021) highlights the need for AI skills and led to investments in teacher training for computing. Pilot programs (often with industry partners) are bringing AI clubs and competitions into schools. Teacher Training: Through agencies like STEM

Learning, teachers receive professional development on data science and AI tools. The focus is on integrating AI examples into existing computing lessons and ensuring teachers can guide discussions on AI's societal impact (e.g. biases in algorithms) in class.

Germany

Education in Germany is decentralized, but there is movement to include AI in curricula. The Standing Conference of state education ministers (KMK) has worked on guidelines for informatics and technology education that include algorithmic thinking and basic AI understanding. One draft curriculum "Identifying and Formulating Algorithms" is being developed for primary and lower-secondary students to build foundational skills (problem-solving, recognizing patterns – seen as a precursor to AI literacy) . Several German states have introduced electives or modules on AI and data science at the high school level in recent years. For example, some Gymnasiums offer informatics courses that cover neural networks basics or use of AI in everyday life. Government Initiatives: Germany's federal AI strategy encourages "AI curricula" development, and funded projects (e.g. KI@Schule) create teaching materials on AI for schools. Teacher Training: The focus is on upskilling IT teachers. Universities and Fraunhofer institutes have launched online training courses for teachers on AI and machine learning, and some states mandate computer science teachers to attend these. Teacher resources (like AI sandbox tools and lesson plans) are being disseminated, but integration varies by state. Full national integration is still in development, expected to expand in coming curricula revisions .

France

France has woven AI topics into existing courses rather than creating a standalone AI subject. In secondary school ICT and math curricula, students now encounter elements of data science, algorithms, and even simple machine learning examples (for instance, using basic AI models in assignments). From 2019, a new Informatics and Creation of Digital Technology class became compulsory in lycée (upper secondary), covering programming and the impact of digital tech – AI is discussed in this context (e.g. training data, automation). Policies: The French Digital Plan for Education promotes coding from primary level and awareness of AI. In 2021, France also launched a national AI strategy which includes educating all citizens about AI ethics, prompting schools to incorporate AI's societal impacts into civics or philosophy discussions. Teacher Support: The Education Ministry and organizations like INRIA provide teachers with AI teaching kits (e.g. unplugged activities to explain AI concepts without computers, and case studies on algorithmic bias). Teachers are being trained through continuous professional development on data and AI topics, often via online platforms. While not formalized as an "AI curriculum," France's approach ensures students encounter AI concepts through multiple lenses (technical, ethical, societal) in their secondary education.

Smaller European Countries

A number of smaller European nations are pioneers in formal AI curriculum integration:

- Austria: Introduced a high-school level specialization in "Data Science and Artificial Intelligence" in 2018 . This track (within the informatics curriculum) teaches students about machine learning algorithms, data analytics, and AI applications, along with ethical and privacy issues. It was part of a broader digital education reform. Teacher training was

provided via university courses (a “AI in education” certification for teachers) and an online platform with AI teaching materials .

- Portugal: As part of its ICT curriculum overhaul, Portugal ensured that AI topics are covered from basic education up to secondary. For example, primary students might learn through playful tools (like training a simple model to recognize objects), while older students undertake projects using AI kits (such as micro:bit sensors or AI image classifiers). The official ICT syllabus includes understanding the concept of AI, its uses in society, and data literacy. The government’s INCoDe.2030 strategy supports teacher training in digital skills, including AI basics . Schools also participate in EU-funded AI education pilots.
- Belgium: In the French-speaking Community (Wallonia-Brussels Federation), a new “referentiel” for ICT was adopted that acts as an IT/AI repository for secondary schools . Rather than a single course, it sets competencies (like understanding AI’s impact, basic coding of AI experiments) that schools must achieve by certain grade levels. Schools have flexibility in implementation – some have created projects on AI in economics or science classes. The government supports this with a “Digital Belgium” initiative, providing teacher toolkits and organizing AI awareness weeks for students.
- Bulgaria: Bulgaria updated its curriculum by introducing “Computer Modeling” in primary grades and “Informatics and Information Technologies” in secondary, embedding introductory AI concepts. By government plan, topics like robotics and AI are gradually introduced after 5th grade. As of 2022, Bulgaria was also piloting a specialized high school course on AI and IoT (with expert groups designing the syllabus) . Teacher training is supported by EU structural funds, and Bulgaria has an AI in Education roadmap aligning with its digital strategy.
- Serbia: Serbia stands out with multiple formal integrations. In grade 8, a revamped course “Informatics and Programming” includes an

introduction to AI and algorithmic problem-solving . In high school gymnasiums, a subject called “Modern Technologies” (taken in 3rd and 4th year) covers emerging tech including AI, machine learning, and their applications . Serbia is even developing additional AI curriculum for all high schools as a standalone module . The government formed working groups for these curricula and collaborated with universities. Teachers received training through a national education institute program, focusing on project-based pedagogy to teach AI. This comprehensive approach is part of Serbia’s goal to be an IT education leader in the Balkans.

Overall, Europe is advancing AI in curricula mostly under the umbrella of digital competence. Ethics and societal impacts are strongly emphasized alongside coding and theory (aligned with EU guidelines on AI ethics in education). Teacher professional development remains a priority, often supported by EU programs and national funds.

Middle East

United Arab Emirates

The UAE is among the first countries to make AI education compulsory for all school grades. In 2019 the UAE announced plans to integrate AI, and by 2025 it launched a nationwide AI curriculum from kindergarten to Grade 12 . Rather than a standalone class, AI is embedded in the existing “Computing, Design and Innovation” subject to ensure a seamless fit . The curriculum is carefully tiered: Young children learn through stories, games, and simple pattern recognition activities that introduce AI concepts in an age-appropriate way, while older students engage with real-world AI applications and projects. By high school, students tackle topics like machine learning basics, robotics, and AI ethics in depth. The UAE curriculum is structured around seven core themes – basic AI concepts, data literacy, algorithms, software use, social impact, innovation, and responsible

design . Notably, there is a strong emphasis on ethics and societal implications at each stage, preparing students to consider the ramifications of AI. Government Policy: This initiative stems from the UAE's National AI Strategy and its broader digital transformation goals. High-level support (even at the Cabinet level) drove rapid curriculum development. Teacher Training: All public school teachers are receiving specialized training to teach AI . The Education Ministry provides lesson plans, assessment frameworks, and project templates to help teachers integrate AI topics confidently . Ongoing professional development and a community of practice for AI teachers are being established. The UAE's approach is a top-down reform, reflecting its commitment to building a knowledge-based, AI-driven economy by equipping youth early on .

Saudi Arabia

Saudi Arabia has recently incorporated AI into its national curriculum at the high school level. In 2025, the Saudi Ministry of Education and SDAIA (Saudi Data & AI Authority) jointly launched a new 12th-grade course "Introduction to Artificial Intelligence" . It is offered as an elective for students in the general (academic) track and aims to provide foundational AI knowledge aligned with global tech trends . The course covers fundamental AI concepts, real-world applications of AI in various industries, and includes hands-on projects. Delivery is blended – a custom digital platform provides interactive content, and teachers facilitate discussions and project-based assessments . This modern teaching model balances theory with practical engagement, encouraging students to experiment with AI tools under guidance . Government Initiatives: Saudi Arabia's Vision 2030 and National Strategy for Data & AI set the stage for this move, recognizing AI skills as critical. The Human Capability Development Program explicitly calls for coding and AI education in schools. SDAIA's involvement ensures the curriculum stays updated with industry developments, and

it’s one of several programs to cultivate AI talent nationally . Teacher Training: Prior to the launch, select teachers underwent training on the AI course content and the digital platform. Saudi authorities have also organized an “Artificial Intelligence Hour” initiative to raise AI awareness in middle schools , signaling a pipeline for future expansion to lower grades. Moreover, the government plans to train 7,000+ individuals (teachers and students) in AI through bootcamps and online courses to supplement formal education . In summary, Saudi Arabia’s education system is taking a phased approach – starting with an elective course, delivered with modern e-learning methods, and expecting to scale up exposure to AI in coming years.

Qatar

Qatar’s Ministry of Education has integrated AI topics via its national ICT curriculum. In secondary school, Qatar offers “Computing and Information Technology” with two streams: a general track for all students and an advanced “High Tech” track for those specializing in science/technology . The advanced track (High Tech) at the high-school level delves deeper into areas like programming, data science, and AI, preparing students for tech careers. Even in the general computing classes (which begin in preparatory school), students get an introduction to AI concepts and coding. This was implemented as part of a curriculum revamp around 2018–2020. Policies: Qatar’s efforts tie into its National Vision 2030, focusing on digital literacy and innovation. The government worked with private partners (e.g. Binary Logic, an education technology company) to design the Computing & IT curricula . Teacher Training: Educators in Qatar have been supported through workshops by the Ministry and external experts to handle the new content. Since the curriculum content is somewhat technical, the Ministry also provided software tools and AI kits to schools. Ongoing mentoring for ICT teachers helps them stay current on AI trends. Qatar also runs national student competitions in

computing, which include AI problem-solving challenges – indirectly boosting teacher and student engagement with AI concepts outside the classroom.

Kuwait

Kuwait has updated its K-12 curriculum standards to include AI basics, especially in earlier grades. According to UNESCO's survey, Kuwait's "standards curriculum" for technology now introduces AI concepts in primary and middle school . This likely means that as Kuwaiti students learn ICT skills (such as using computers and simple coding), they also learn about what AI is, examples of AI in daily life, and perhaps engage with simple educational AI tools (like basic robotics or smart assistants). Government Initiative: Kuwait's education reforms, under its National Education Technology Plan, recognized AI as a key topic for the 21st century. Committees of curriculum experts and teachers developed age-appropriate AI content . By including AI early, Kuwait aims to build awareness from a young age. Teacher Training: Implementation is supported by training courses for teachers on the new tech standards. Since it's integrated into general ICT classes, existing ICT teachers were trained on the additional AI topics. Resources such as guidelines on discussing AI ethics with young students and simple AI demo activities were disseminated. This foundational exposure sets the stage for more advanced learning in higher grades (Kuwait is expected to expand AI content into secondary levels in the future).

Jordan

Jordan has taken significant steps by revamping its national curriculum to include AI and programming. In October 2024, the National Center for Curriculum Development announced that a new "Digital Skills" curriculum will teach programming and AI in 7th, 9th, and 11th grades . This staggered introduction allows students to build

on their knowledge at each stage (basic coding and concepts in grade 7; more advanced programming and AI theory in grade 9; and applications/ethics in grade 11). As part of this plan, Jordan is updating textbooks for grades 1–12 to add many modern topics. The updated books include content on the Internet of Things (IoT), artificial intelligence, cloud computing, and Python programming – areas previously not covered in old curricula . The goal is to enhance students' digital competencies and problem-solving skills, aligning education with global technological advancements . Government Policy: This move is under Jordan's Education Modernization efforts, ensuring the workforce of the future has relevant skills. It also ties into national initiatives to boost ICT sector growth. Teacher Training: Jordan is implementing teacher training in phases. Initial training focuses on the new content for 7th-grade teachers (as they are first to teach the Digital Skills curriculum), then will extend to other grades over the next two years . The Ministry of Education, often in partnership with international donors and tech companies, is providing training workshops and resources. Early feedback from teachers is used to refine materials. By incorporating AI and coding, Jordan aims to foster a generation capable of innovation in the digital economy.

Other Middle East & North Africa

Across the MENA region, interest in AI education is growing. Oman and Bahrain, for example, have introduced coding in schools and are exploring AI club activities, though as of 2022 Bahrain reported no formal AI curriculum yet . Israel (not part of the UNESCO survey) has specialized high-school programs in computer science and robotics that touch on AI (Israel's Ministry of Education supports an AI and robotics track in some schools, often partnering with tech firms). In Egypt, discussions are underway about updating the secondary ICT curriculum to include AI basics as part of the country's digital transformation initiative. Many Gulf countries (UAE, Saudi, Qatar,

Kuwait as detailed above) are leading with top-down policies, while others are still in pilot phases. A common thread in the region is the emphasis on aligning with national AI strategies and preparing youth for future job markets in AI and tech.

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Notes

References include UNESCO's 2022 global survey of K–12 AI https://www.unesco.org/en/articles/unesco-releases-report-mapping-k-12-artificial-intelligence-curricula government press releases (e.g. UAE www.gulfnews.com , China english. www.gov.cn , education think tank reports https://crpe.org , northernvirginiamag.com , and reputable news sources (e.g. Gulf News, Jerusalem Post). Each citation in brackets links to the source excerpt supporting the statement.