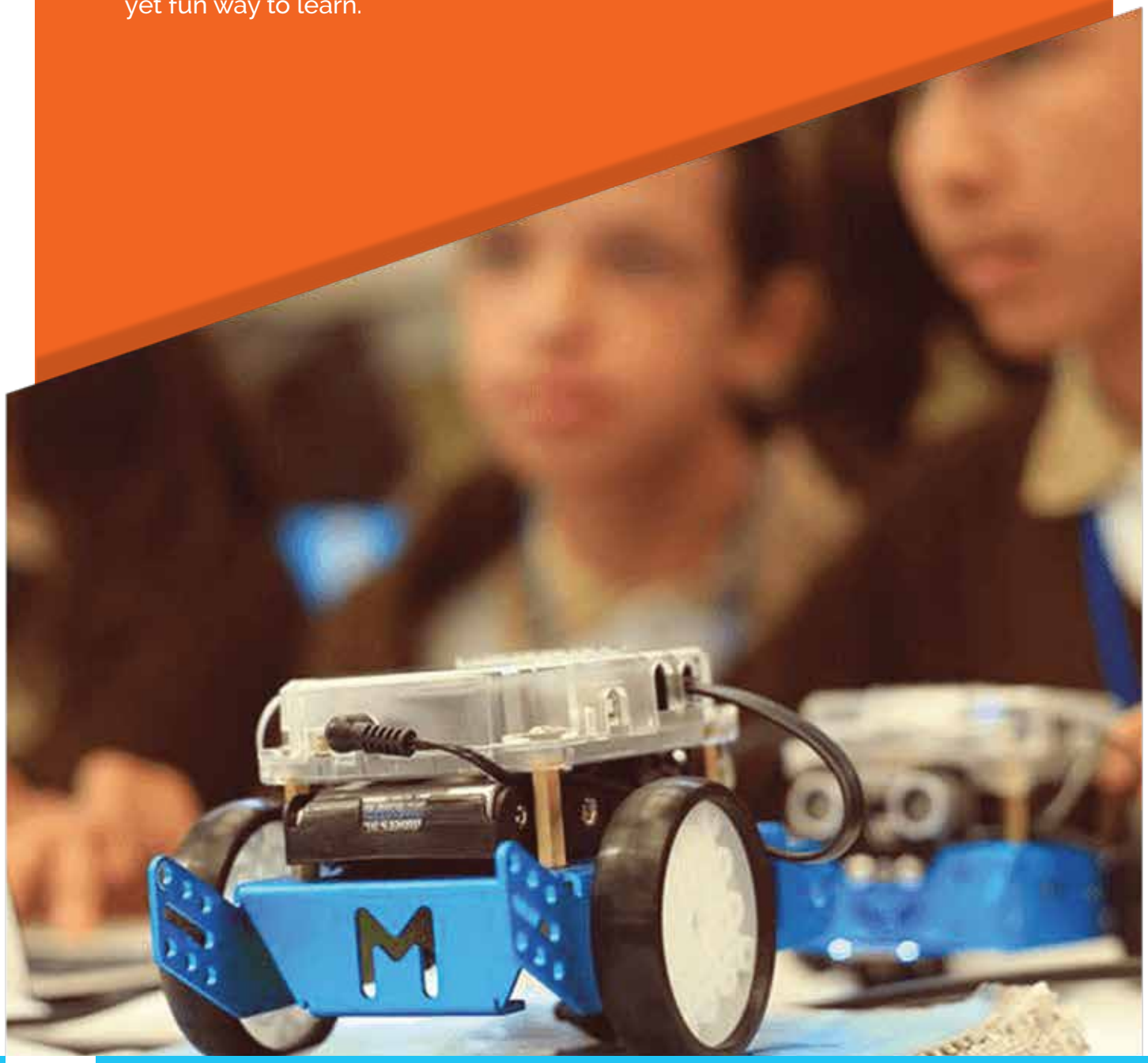
Building STEM Competencies in Schools

Powered by Modo Edulabs

21st Century Learning

STEM education has emerged as one of the most sought-after curriculum designs for integrating science, technology, engineering, and mathematics into K-12 education. It first became popular as a means of serving the needs of mathematically gifted students, providing opportunities to both accelerate learning and increase the rigor and depth of learning. However, in today's' technology-driven world, it's important now more than ever to prepare students for the future. With increasing technological advancements in our day-to-day lives and the way we work, STEM education has become almost mandatory for every student. Robotics as a subject has the distinct advantage of combining all the components of STEM into a meaningful
yet fun way to learn.



Why Teach Robotics in Schools

Teaching robotics to young students throughout their schooling can increase their ability to be creative and innovative thinkers and more productive members of society. Many governments, especially in mature economies, have already recognized the importance of robotics in the classroom and have begun to create programs and laws that would incorporate it into their public education system. By teaching our students the basics of robotics, we can open a whole new world to them and exciting opportunities that they wouldn't have access to otherwise.

Robotics takes hidden, mystical technological processes and makes them accessible and easy to understand. Not only does this create a more stable environment for younger students to approach programming and coding, but it also opens up potential for students to explore other areas of learning that seem too difficult or complex.

Top Benefits

Problem Solving

Inclusion of robotics coursework in school requires students to understand fundamental problems and how to overcome them. This is done through brainstorming in a group setting or trial and error for individual students. Applying the concepts of math and science to real life applications is an important concept for students.

Much like in real life situations, students are taught to use their explorative mind. In addition to memorizing theorems and answers, students are encouraged to find new ways to solve the same equations. Additionally, the incorporation of team exercises helps children understand how enlisting others can lead to resolutions.

Creativity

Not many fields combine creativity with engineering and technology, but robotics does. When students are given the opportunity to create something interactive that they think is interesting, their engagement levels increase, and they retain more information. One might be surprised at the things kids can create when given the right information and tools. In fact, students love to partake in activities in which they have full control, something that is possible with robotics.

Future Ready

It's no secret that jobs in the STEM field are the fastest growing careers, and are projected to grow exponentially. By the time our students graduate in a few years or so, over half of the available jobs will be in the STEM field and a large proportion of the rest will require employees to have some STEM knowledge. When students are introduced to robotics in their school years, they can discover any interests and talents that they may have in this job market. With advanced technologies such as artificial intelligence, driverless cars, and spacecrafts taking shape every day, the present generation of students needs to be more prepared for technological changes than any before.

Innovation

Introducing robotics in schools can help our students turn their frustration into creativity and innovation. This also turns out to be a valuable life lesson that teaches our students perseverance and determination when faced with challenges.

Inclusivity

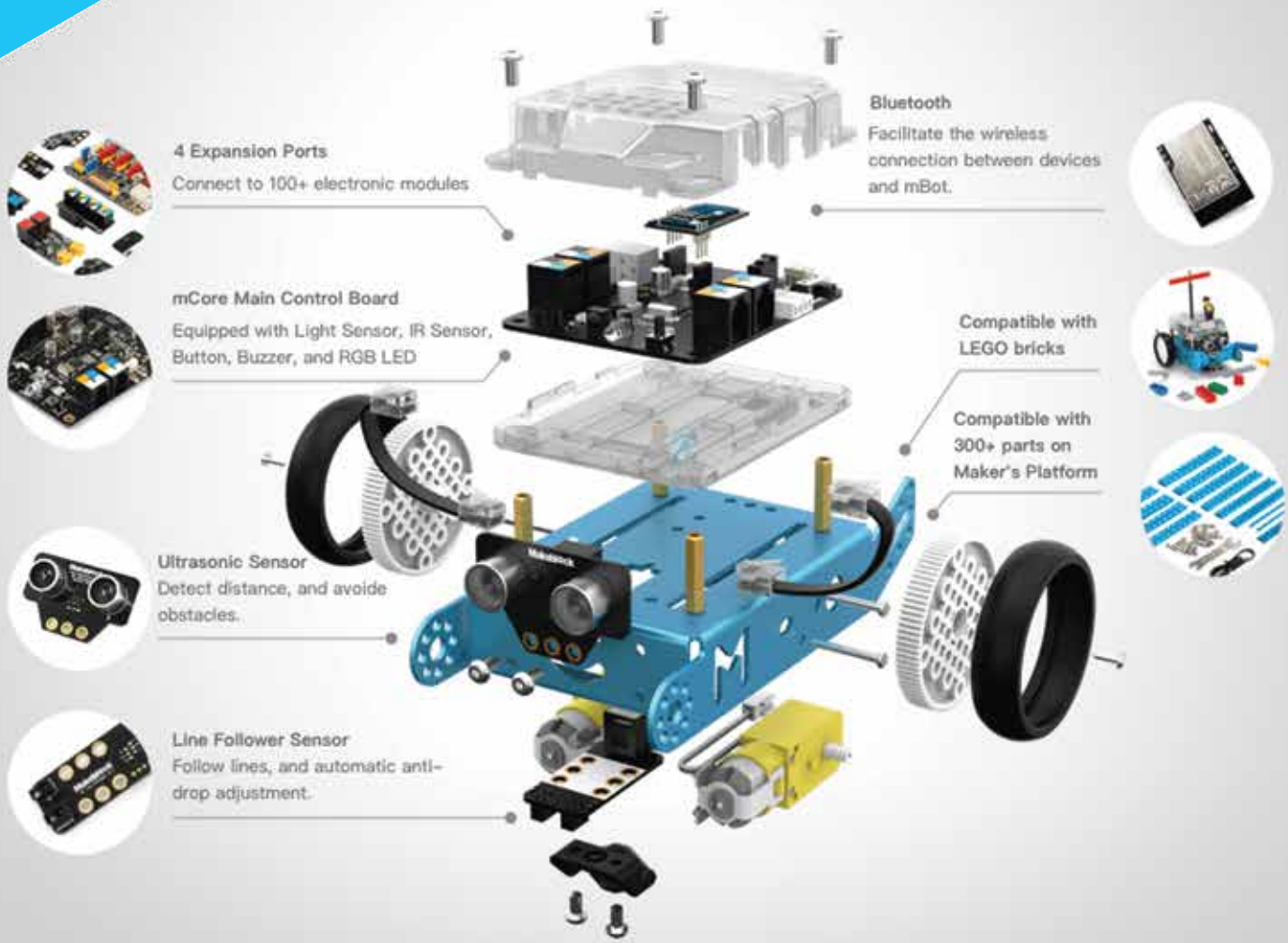
Robotics is a field that is easily accessible to a wide range of students with varying talents and skills. Studies have shown educational robots do a great job of engaging students on the autism spectrum. Robotics is also a field that has the ability to empower young girls in the classroom. It incorporates a range of skills, and thus promotes a learning environment for people with different talents. If properly harnessed, it also promotes a culture of teamwork.

Programming Skills

Learning to program a computer is an excellent skill to have to make students more likely to get a job in the future. As artificial intelligence becomes more prevalent in homes, schools, and offices, programming knowledge will help every student understand how the robots work. But teaching young students the abstract subject of programming can be a challenging feat, and often complex for most students to grasp. Robotics is a simpler to understand and more tangible introduction to programming.

About Modo

Modo Edulabs Private Limited is an educational organization with a vision to introduce, excite and inspire K-12 students on STEM topics through interactive, hands-on courses using educational robots. Modo's intent is to partner with pioneering schools that wish to create a difference among its students by providing access to top robotics and programming courses.



Modo Courses

The École program is targeted at students in the grades 4 and above, and offers five levels of integrated, progressive learning curriculum.

Level	Description
JumpStart:	JumpStart is ideal for beginners. This course provides introduction to the world of robots and robotics and relate them to concepts of physics and mathematics. JumpStart introduce students to sensors, circuits, flowcharts, algorithms. The course includes Scratch – a visual programming tool, not only it introduces Scratch but also jumps into kit-based programming with advanced modules. JumpStart also introduces students to handheld computing systems like Arduino boards.
StepUp:	StepUp is an intermediate course that introduces advanced sensors. We live in a world of sensors around us. In StepUp, students learn about different types and uses of sensors, with hands-on activities and projects. Through interconnectedness, students also get a peep into the burgeoning space of Internet of Things (IoT).
Code.AI:	Code.AI is an interesting midway to the growing STEM expert. Code.AI goes deeper into programming, moving from visual programming to the text level coding. In this level students are also introduced to advanced computing systems such as Raspberry Pi. Also, Code.AI helps students to make sense of data that is emerging from various sensors for automated and smarter performance, especially for repetitive and/or standarized tasks.
Phantom:	Phantom advances a student to the world of automated things – flying drones, cars, etc. In this level, students will be able to design and assemble high end kits, and programme them to perform automated tasks.
Ultima:	Ultima is the culmination course that delves into machine learning or deep learning. In addition, in this level a student works on custom kits on individual or group level projects that are outcome-driven.

During the academic year 2019-2020, Modo offers the first two levels of course in schools.

Level 1: JumpStart

JumpStart is a beginner's course ideally suitable for students in grade 4th, 5th, and 6th. No prerequisite knowledge in programming is essential. Basic Science upto grade 3 is sufficient. JumpStart spans for 25 classes, each lasting for approximately 40 minutes.

• Intro to Robots and Robotics • Types of Robots • Motors & Controllers • Sensors • Flowchart & Algorithm • Circuits & Switches • Kit Assembly • Introduction to Scratch • Using Advanced Blocks in Scratch • Introduction to mBlock • Concepts of Physics • Introduction to RGB LED in kit • Introduction to Buzzers • Introduction to Motors • Relationship between Physics & Robotics • Programming Light Sensors • Robots on Mars • Intro to Drones • Programming the Ultrasonic Sensor • Future of Drones • Intro to AI • Programming the Line Follower • Intro to Autonomous Vehicles • Autonomous Cars • Programming the LEDs • Intro to 3D Printing • Latest Robots • Programming with Advanced Blocks/Functions

Level 2: StepUp

StepUp is an intermediary course for students who have completed JumpStart. Ideally this course is suitable for grades 7th and 8th – having had basics on electronics and in visual programming. StepUp includes 25 classes, each lasting for approximately 40 minutes.

• Electronics Concepts • Advanced Flowcharts & Algorithm • Introduction to Snap Programming • Introduction to Arduino • Basics of Snap4Arduino • Introduction to Sensor Technologies • Unboxing & Assembly of the Advanced Kit • Ultrasonic Sensor • Line Follower Sensor • Light Sensor • Color Sensor • Sound Sensor • PIR/Motion Sensor • Pressure Sensor • Water Level Sensor • Metal Touch Sensor • Shock Sensor • Capacitor Sensor • Temperature/Humidity Sensor • Gas Sensor • Heart Beat Sensor • Magnetic Hall Sensor • Adv Programming • Intro to open-source Arduino Software • Intro to Concepts on Internet of Things (IOT)

Why Modo?

Innovative Turnkey Solution
The École program is a unique, turnkey offering for schools that wish to introduce robotics and programming to their students. The unique École program eliminates the hassles and the need for steep investments, but ensures students gain best-in-class exposure and experience through our seamless management model.

The École program ensures the required equipment such as computers, robotic kits, software, and reference materials are all provided and managed by the Modo team.

Digital Delivery
Modo's classes are delivered digitally to ensure consistent delivery of topics, activities, and overall learning pace. Our experienced content specialists keep the content up-to-date and globally relevant, which are relayed from our centrally managed servers. Digital content powered with audio visuals excite the students and keep them engaged.

Hands-On Learning
Modo has partnered exclusively with renowned educational kit suppliers who kits are of top quality, learning oriented and most importantly, deliver great experience. In addition to the kits that are dedicated to the program, Modo will also strive to introduce students to latest technologies such as 3D printing, virtual reality and many more through live camps throughout the year.

> Educating students in STEM subjects (if taught correctly) prepares students for life, regardless of the profession they choose to follow. Those subjects teach students how to think critically and how to solve problems — skills that can be used throughout life to help them get through tough times and take advantage of opportunities whenever they appear.
>
> **Stephen F Deangelis in Wired.com**

Your opportunity to Lead

In this increasingly technology driven world that we live in, it is imperative that we prepare our students for the future. Introducing robotics and programming early on is definite first step in this process. Talk to us today.

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