



THE ULTIMATE GUIDE TO **FUTURE-PROOF** YOUR TEACHING CAREER

Transition to STEM and Screen-
less Robotics Education



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Summary:

This Book outlines a roadmap for primary school teachers to transition into robotics education, focusing on a screen-free, hands-on approach. It argues that the evolving landscape of education necessitates a shift towards STEM, particularly robotics, emphasising creativity and critical thinking over rote programming. The ebook champions the flipped classroom model and highlights the growing demand for robotics educators, presenting TokyMini, a screen-free robotics kit, as a key tool for this transition. It promotes the numerous career advantages of becoming a robotics teacher and offers resources and support to facilitate this change.

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To hear the podcast, click on PLAY or visit:

https://files.tokylabs.com/podcast/Screen_Free_Education.wav

Introduction:

At TokyLabs, we believe that programming skills are losing relevance compared to the essential soft skills of the 21st century. In essence, programming is no longer as crucial for robotics as it once was. In the past, robotics was designed exclusively for experts, but today machines have become more accessible and exhibit near-human interaction capabilities. Coupled with the fact that AI is now one of the best “programmers” in the world, programming has become just one part of the broader skill set needed for future success.

This shift is not necessarily a pessimistic sign; rather, it presents an exciting opportunity to redefine educational robotics by placing greater emphasis on creativity, critical thinking, and problem solving—without focusing solely on programming and electronics. We are embracing this paradigm shift by creating a system that empowers individuals who may not be proficient in programming but excel in other areas, such as creativity and critical thinking, to bring fresh and innovative value to STEM and robotics education. In doing so, we adapt robotics to modern times and help prepare new generations for an uncertain future.

But, how is robotics related to STEM after all?

STEM (Science, Technology, Engineering, and Mathematics) is a broad and interdisciplinary field, designed to foster a transversal approach to education. Robotics seamlessly integrates all aspects of STEM, and even extends into areas like Art and Design, making it a highly versatile subject.

As educational curricula evolve to meet government standards, robotics is increasingly introduced in schools as a comprehensive way to address multiple learning objectives. However, there is a shortage of qualified professionals to teach it, creating opportunities for educators who want to advance their careers, teach a new subject, or explore new job prospects in education.

In this book we will present a step by step method to become a certified STEM Robotics Teacher for primary school students and effectively implement engaging robotic projects that nurtures the right set of skills in the students for the future while levelling up your income with the promotion to a higher paid position.



CHAPTER 1

The Changing Educational Landscape:

1.1 Why traditional classroom models are evolving to embrace STEM (Science, Technology, Engineering, and Math) and robotics.

Education is undergoing a profound transformation, shifting from traditional models to more dynamic, student-centric approaches. The increasing integration of STEM (Science, Technology, Engineering, and Math) and robotics into classrooms is a direct response to this change. Unlike purely theoretical disciplines, STEM remains highly resilient to the impact of AI. Its emphasis on practical application, problem-solving, and hands-on experimentation makes it less susceptible to automation, ensuring that students develop skills that remain relevant in the workforce.

A major shift in modern education is the move toward student-centric learning, where students take an active role in their education rather than passively absorbing information. One of the most effective methodologies for this transition is the flipped classroom model. In this approach, students learn theoretical concepts at home through books, videos, podcasts, or AI-powered resources. Then, during class time, they engage in hands-on experiences, applying their knowledge through experiments, projects, and collaborative problem-solving exercises. Since STEM is inherently practical, this methodology fits seamlessly, creating an environment where assessments happen through action rather than traditional exams. This not only enhances learning but also reduces the concern that students might rely on AI tools to complete their assignments, as their understanding is demonstrated through real-world applications.



As the world becomes increasingly technological, the need for technical literacy is greater than ever. While software development itself is becoming more automated, computational thinking remains a critical skill for the future. Understanding the fundamentals of programming allows students to recognize opportunities for innovation, evaluate the feasibility of tech-driven solutions, and adapt to a job market that demands technical fluency. STEM education ensures that students are not just passive consumers of technology but active creators and problem-solvers who can shape the future rather than merely respond to it. Beyond technical knowledge, STEM is also a powerful tool for developing essential soft skills. Creativity, critical thinking, and problem-solving are at the core of STEM education, encouraging students to think outside the box, analyze complex challenges, and develop structured approaches to finding solutions.

Additionally, STEM education is broad and versatile, offering students the opportunity to explore different fields and discover their specific interests. Whether in engineering, data science, environmental science, or robotics, STEM serves as a gateway to multiple career paths, inspiring curiosity and lifelong learning. This versatility allows students to connect their education with real-world applications, making learning more meaningful and engaging.

As we move deeper into the age of information and technology, traditional classroom models must evolve. STEM, combined with modern teaching methodologies like the flipped classroom, provides a dynamic, hands-on learning experience that prepares students for the challenges of the future. By embracing this approach, educators can help young learners develop the technical, analytical, and creative skills necessary to navigate an increasingly complex world with confidence.



1.2 The increasing role of robotics and technology in future careers, and why it's essential for students to start early.

With robotics and technology becoming integral to future careers, it is crucial to introduce these subjects early. Research, highlights the rapid growth of job opportunities in STEM fields.

- ✓ 65% of our daughters and sons will have a job that does not exist yet
- ✓ 50% of new job opportunities created by technological advancements are STEM-related.

Early childhood is a critical period for character development—children learn to manage frustration and acquire language skills before the age of nine, abilities that are much harder to develop later. Instilling the right skills at the right time is like nurturing a young tree from a sprout, resulting in durable and tangible benefits.

This raises a key question: How can we effectively teach robotics to young students, whose dexterity, focus, and retention capabilities are still developing, especially when educators may come from a non-tech background?

In this book, we will explain a step-by-step process to quickly excel in your career as a robotics teacher for primary school students. You'll learn how to achieve high levels of engagement, rewarding outcomes, and impactful learning experiences for children—regardless of your previous technical background.





1.3 Teachers' role in shaping the future of education

Teachers' mission has changed dramatically with the new technologies and instant access to information. Traditionally, knowing the right answer was key. Whereas now, asking the right questions has become more critical than ever. The ability to formulate precise questions reflects a logical, structured mind—one that understands reality, organizes ideas clearly, and is driven by a spirit of exploration. When one asks the right question, it shows an understanding of the depth of the unknown behind it—this curiosity is what propels humanity to the next frontier.

Robotics has evolved into a space for Socratic dialogue, where every question is welcomed, and learning thrives through inquiry. Teachers who embrace this approach gain a clear competitive edge, making them highly sought after in primary education. In this eBook, we'll guide you through the exact process to become that educator. Teachers are no longer mere providers of knowledge. While AI language models and other digital tools can deliver information with unmatched precision and speed, educators play a unique role in sparking curiosity and nurturing a love for exploration. By fostering an inquiry-based learning environment, teachers encourage young minds to habitually ask questions, a process that shapes both their intellectual and personal development. When a child develops the habit of asking questions, it shapes their cognitive and emotional growth in profound ways. Curiosity fuels critical thinking, helping children analyze, evaluate, and connect ideas rather than passively accepting information. As they seek answers, they naturally develop problem-solving skills, learning to break down complex issues and explore different solutions. This habit also strengthens emotional intelligence, as questioning encourages them to understand perspectives, recognize emotions, and navigate social interactions with greater empathy.

Furthermore, a child who frequently asks questions gains confidence in expressing their thoughts, engaging in discussions, and advocating for themselves. Instead of simply absorbing knowledge, they learn to challenge assumptions, form their own opinions, and approach learning as an ongoing process of discovery. This intellectual autonomy fosters resilience, adaptability, and a growth mindset—key traits for thriving in an ever-changing world.

Encouraging a questioning mindset nurtures creativity and open-mindedness, helping children explore multiple possibilities instead of seeking one right answer. This fosters divergent thinking, making them more innovative, adaptable, and open to new perspectives—laying the foundation for lifelong learning and critical thinking. This shift underscores the need for robotics educators who blend technical expertise with the art of questioning, equipping students with skills for a tech-driven world while inspiring deeper exploration of challenges.

Here is an example of this socratic dialogue in practice:

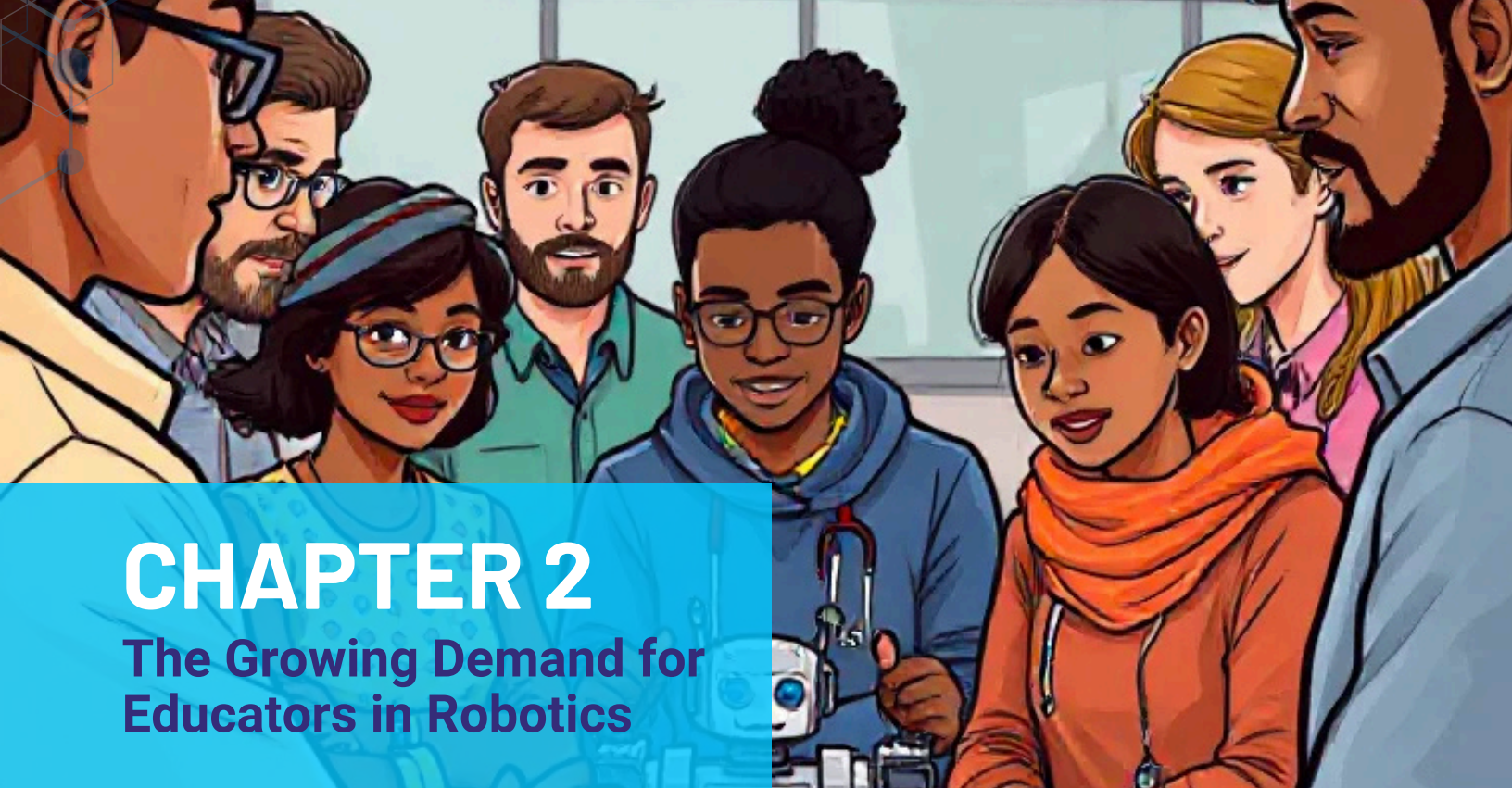
At Tokylabs, in late 2024 we were invited to co-run a **hackathon**, an event where participants collaborate intensively to develop innovative solutions to a given problem. Our role included defining the central topic, and we chose **plastic pollution** as the challenge to tackle. Rather than jumping to quick solutions, we encouraged all teams to ask themselves “**why?**” at least three times, uncovering the deeper causes of the issue and possibly inspiring them to advocate for meaningful change.

To start, we presented a **case study** on plastic waste floating in the ocean, highlighting activist groups that use boats to collect plastic still lingering on the surface. When participants asked “**why?**” this waste accumulates in the ocean, they realized that much of it originates from beaches, where plastic debris is eventually carried away by tides. This led them to explore companies focusing on beach cleanups. Asking “**why?**” again, they traced the problem back to rivers, where another major portion of plastic waste originates before flowing into the sea. NGOs are actively working to intercept plastic at this stage.



Image of a Hackathon in Florida Polytechnic University, where Students work to build and code a robotic arm. (<https://floridapoly.edu>)

Finally, questioning “**why?**” once more revealed that plastic pollution in rivers is largely due to improper disposal, often involving single-use plastics. This exercise helped participants see that while ocean cleanup is crucial, addressing pollution upstream—before plastic reaches waterways—could be even more impactful. Focusing solely on cleanup efforts in oceans, beaches, and rivers addresses only the symptoms of plastic pollution. Organizations like Bye Bye Plastic Bags emphasize that true impact comes from preventing plastic waste at its source through education, policy change, and shifting consumer behavior. This approach highlights the importance of understanding and tackling the root causes of complex environmental issues.



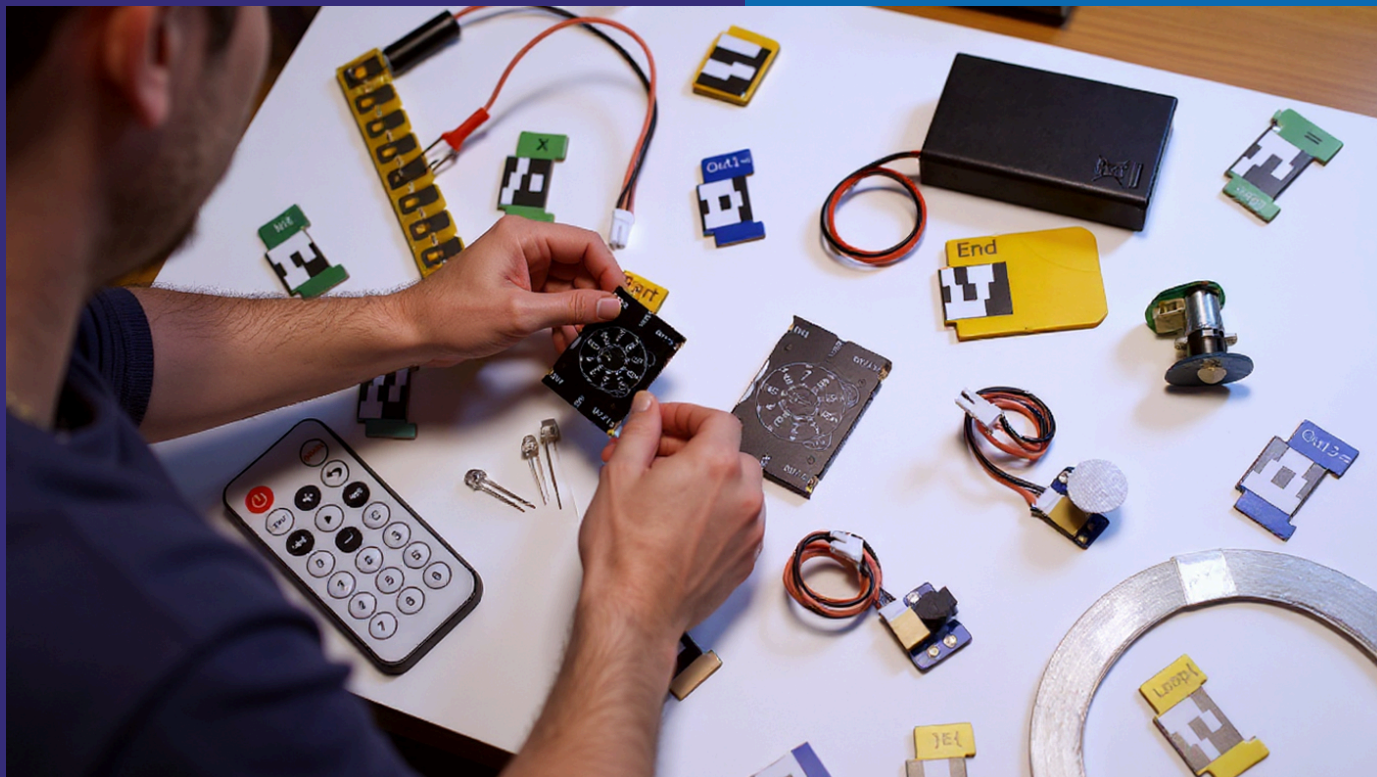
CHAPTER 2

The Growing Demand for Educators in Robotics

Why Upskilling to Robotics Teaching is a Smart Career Move

Upskilling to robotics teaching is a strategic career move with increasing demand, strong job security, and competitive salaries. As educational institutions worldwide integrate robotics into their curricula, the need for skilled educators is growing rapidly. According to the U.S. Bureau of Labor Statistics, STEM-related jobs are projected to grow by 10.8% between 2022 and 2032, significantly outpacing the 2.3% growth rate for non-STEM occupations [18]. This shift is not limited to schools—robotics educators can find work in STEM academies, educational technology companies, online learning platforms, and corporate training programs. Some even launch their own courses or workshops, turning their expertise into a profitable career path [19].

Robotics educators also earn higher salaries than general teachers. In the U.S., the average salary for a robotics teacher is \$62,62 per year, with top earners making up to \$87,14 annually [20]. Schools and institutions often offer premium pay for robotics specialists, while private STEM organizations, EdTech companies, and corporate training programs pay even more. The financial benefits extend beyond salaried positions—freelance opportunities in online education, private tutoring, and workshops allow teachers to increase their income, sometimes surpassing what they would earn in a full-time teaching role. STEM jobs pay significantly more, with a median salary of \$95K vs. \$40K for non-STEM roles. [18].



Beyond financial incentives, robotics teaching is a future-proof career. As industries continue investing in automation, AI, and robotics, educational institutions must prepare students for this evolving job market. Robotics education is not just a passing trend; it serves as a bridge between theoretical knowledge and hands-on application, equipping students with critical problem-solving skills. While some traditional teaching jobs may face automation, robotics education requires creativity, hands-on learning, and problem-solving—skills that AI cannot replicate yet [19]. With long-term job security, strong salary prospects, and a growing number of career paths, upskilling to robotics teaching is one of the best decisions educators can make to future-proof their careers.

OPPORTUNITY

- ✓ **The U.S. Department of Education is dedicating \$120 billion grant to support K-12 STEM**
- ✓ **Despite the rise of AI automation, STEM occupations will enjoy double the growth rate of non-STEM occupations**

Plus, it empowers students to become innovators, prepares them for tech-driven careers, and strengthens national STEM competitiveness.

CHAPTER 3

Why STEM and Robotics is crucial in the Future of Education

As education evolves, STEM integration is essential to prepare students for a changing world. This chapter highlights how robotics builds technical and soft skills in young learners through a screen-free, hands-on approach tailored to their development.

3.1 The Role of Robotics in the Modern Curriculum:

Robotics has emerged as a powerful interdisciplinary tool that bridges science, technology, engineering, and mathematics. This multidisciplinary approach not only breaks down traditional subject silos but also promotes a blend of analytical thinking and creative problem-solving—a dynamic that is critical in today's educational landscape [12].

Building Critical Skills

Robotics projects encourage students to tackle real-world problems by designing, testing, and refining their creations. In doing so, learners develop essential skills:



Problem-Solving:

By breaking down complex challenges into manageable parts and iterating through trial and error, students build resilience and adaptive thinking [9].



Creativity and Innovation:

The process of conceptualizing and constructing robotic systems pushes students to think outside the box, driving innovation beyond standard curricula.



Collaboration and Communication:

Working in teams to build and program robots enhances cooperative skills and mirrors the collaborative nature of modern workplaces.

Integrating Robotics into Classroom Learning

Robotics serves as a catalyst for hands-on learning, transforming abstract theories into tangible experiences. This approach aligns with current educational standards and methodologies, such as the ISTE Standards for Educators [13]. Moreover, strategic initiatives outlined by national policies emphasize the need for integrated STEM education [15].

3.2 Benefits of Screen-Free Learning for Primary student:

While digital tools play an important role in modern education, excessive screen time can have detrimental effects on young learners. Research has indicated that prolonged screen exposure is linked to issues such as reduced focus and potential vision problems [5]. In contrast, screen-free, hands-on learning experiences offer significant advantages:

Tactile Engagement: Physical interaction with materials—using puzzle-like blocks and kid-friendly components—promotes deeper understanding and enhances psychomotor skills. This type of engagement is especially beneficial for children aged 6 to 9 years, who thrive on play-based learning [7, 16].

Enhanced Cognitive and Emotional Development: Without digital distractions, students can focus more intently on tasks, leading to improved concentration and emotional regulation.

Alignment with Market Trends: Global market analyses have shown a significant shift toward tactile, screen-free learning tools, emphasizing a move away from purely digital education models [1, 2].

Maintaining Traditional Learning Values: Despite the rise of digital platforms, traditional classroom tools remain relevant and effective, as documented in studies on educational technology trends [6].



In addition to that, hands-on, screen-free projects allow children to explore robotics in a way that promotes open-ended inquiry and creative problem-solving. As students build and assemble their projects, they are encouraged to experiment and iterate, learning valuable lessons in trial and error. This process helps them develop several key skills:

Confidence: Easy-to-use materials help kids build and adjust projects, boosting their confidence.

Dexterity: Handling components improves fine motor skills and hand-eye coordination.

Psychomotor Skills: Planning and building strengthens coordination between mind and movement.

Creativity: Creating from scratch sparks imagination and encourages real-time problem-solving.



Furthermore, addressing the shortage of qualified educators in Robotics is vital. Reports on teacher shortages highlight the critical need for professionals who can bridge the gap in modern, hands-on STEM education [8]. According to the National Science Board, providing students with hands-on STEM experiences is key to preparing them for future challenges [10]. Effective teacher professional development is essential in this regard, ensuring that educators are equipped to harness the full potential of robotics in the classroom [14].

As data from organizations like the U.S. Bureau of Labor Statistics [3] and the World Economic Forum [4, 11] indicate, the demand for STEM competencies is rapidly growing. By embracing innovative teaching methods that prioritize tactile learning and by investing in effective teacher training [9, 13, 14, 15], educators can empower their students to excel in an increasingly competitive, technology-driven world.

TokyMini training makes robotics education fun, hands-on, and screen-free for young learners. Its simple tools and open-ended projects promote playful learning, while the teacher program helps educators of all levels confidently bring robotics into the classroom.

- ✓ **Step-by-step curriculum for young learners.**
- ✓ **All essential robotics kits included.**
- ✓ **Hands-on support for easy robotics integration.**
- ✓ **Practical strategies to engage students**
- ✓ **Ready-to-use framework with no coding required.**

CHAPTER 4

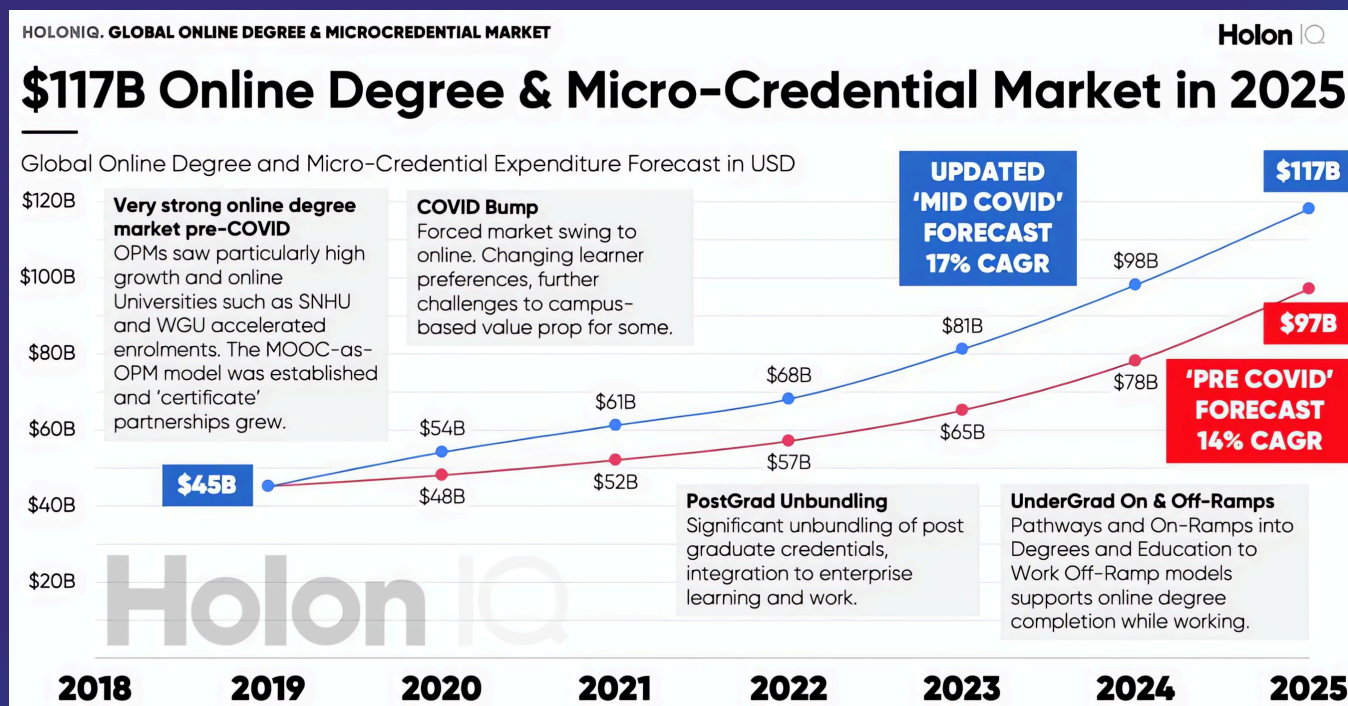
Transitioning from Traditional Teaching to Robotics

In this chapter, you'll discover that you don't need a programming background to become an exceptional robotics educator for primary school students. We'll guide you through the exact steps to fast-track your career, apply these skills effectively, and increase your income by leveraging this in-demand teaching profile.

4.1 Microcredentials.

In the current context of rapid technological advances and changes in the labor market, adaptability and the ability to learn new skills are increasingly valued. Long-term technical studies are often not best suited to specialise you for a rapidly changing market, and instead Microcredentials offer the exact knowledge you need to specifically apply in your job to bring your income to the next level. This is particularly relevant in fields like technology, where skills and tools can evolve rapidly.

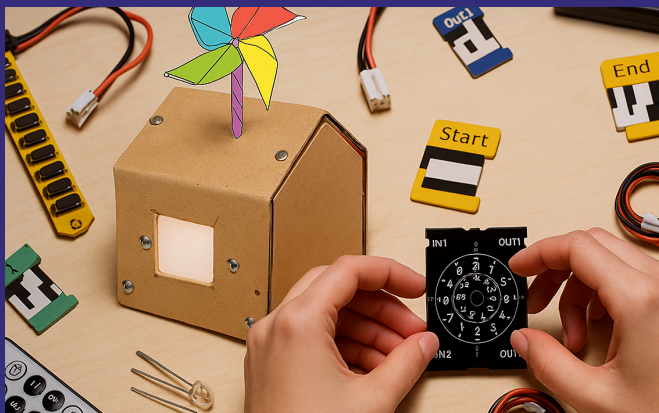
Don't get me wrong, longer degrees often provide a strong foundation in theories and fundamental concepts, which can be essential in the long run. Shorter trainings or Microcredentials can be advantageous as they allow students to acquire specific skills more quickly and adapt to the changing demands of the labor market. And this is particularly beneficial to you, if you are aiming to transition to teaching robotics but your major degree are in non-technical fields.



4.2 Learning Robotics:

Why It's Easier Than You Think:

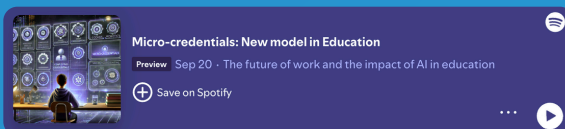
What happens if you leave a discipline in regular education like STEM and Robotics (that embraces so many skills) to be taught only by tech experts? Robotics is not just about programming or hard electronics. It is also about approaching to a problem creatively. It is about being able to utilize the available resources and technology to make a positive impact in the society. The concept of an educational robot is not anymore a car that drives autonomously avoiding obstacles, it is way more creative than that. It is an idea turned into reality that solves a problem. It is the materialization of a conceptual solution. Why are we assuming that as long as you are good at programming then you are ready to teach robotics? This assumption is positioning the programming aspect above the rest of skills in the robotics field, and this is a mistake in the realm of educational robotics for primary school students.



In fact, as we will see later in this book, programming skill is becoming less relevant as machines powered by AI are approaching to an understanding of our natural language. In a near future, we will be able to program a robot by simply telling "it" what to do by voice or by visual exemplification. And as we mentioned earlier in the introduction, successful roboticists will depend on the ability to explore the root of the problem with critical thinking, and creativity to provide an innovative approach to a certain problem, object of study.

This is an open door for a wide range of profiles such as non-technical teachers to get interested in robotics, as they can apply their soft skills in this field and to be less limited by their lack of deep knowledge in programming.

Robotics may seem intimidating with complex wiring, electronics, and coding—but fear of errors and frustration in the classroom is common and can be avoided with the right tools and support. This is because most robotic kits are made by tech experts for tech experts, lacking an educational approach that suits diverse learners with varying skills and interests.



We are proud to tell you that
those days are over:

[HTTPS://WWW.YOUTUBE.COM/WATCH?V=SEIKK00Y4PQ](https://www.youtube.com/watch?v=SEIKK00Y4PQ)

CHECK OUT THIS VIDEO!

4.2.2 Tokymini

After years of relentless hard work, countless tests, moments of frustration, and unwavering perseverance, we have brought to market what we believe is the first truly modern and holistic robotics solution tailored for primary education. We proudly introduce TokyMini.

TokyMini is not just a robotics prototyping tool—it is a child-centered innovation designed with a deep focus on both mental and physical well-being. Every aspect has been carefully crafted to support young learners' development while making robotics education more accessible, engaging, and developmentally appropriate.

Why TokyMini is Different for students

Curriculum Built for Holistic Growth

Designed and refined over years of testing, the TokyMini curriculum prioritizes soft skills development, dedicating 70% of its PBL structure to fostering creativity, critical thinking, problem-solving, and psychomotor skills, while keeping electronics and programming at a 30%. This ensures that students build a well-rounded foundation in STEM.

A Screen-Free Robotics Experience

Unlike traditional robotics kits, TokyMini eliminates screens entirely. Programming is done through physical puzzle pieces, allowing children to move from idea to execution without digital distractions or concerns about eye strain and overexposure to screens. This tactile, hands-on approach enhances cognitive engagement and motor skill development, making learning more natural and immersive.

Designed for Young Hands and Minds

Every component—from cables and connectors to electronic parts—has been thoughtfully adapted to match the dexterity and coordination levels of primary school students. The system is built to be intuitive and foolproof, ensuring that children can explore and experiment without the risk of incorrect connections, accidental damage, or frustration from technical mishaps.

With TokyMini, we are setting a new standard for robotics education in primary schools—one that nurtures creativity, encourages hands-on learning, and prioritizes the well-being of young learners. In the next chapter, We will give you the keys to implement effortlessly a STEM Robotics class.

Why TokyMini is different for Teachers?

Effortless Hardware Setup

The plug-and-play proprietary connection system ensures that components cannot be connected incorrectly. This eliminates troubleshooting stress, allowing teachers to focus on teaching and guiding students, rather than fixing wiring issues.

Intuitive Programming

TokyMini's programming system is designed for clarity and ease of use, making it accessible for educators regardless of their prior coding experience. The restructured logic ensures that teachers can quickly understand and create programs, making robotics approachable for both teachers and students.



Soft Skills Matters in Robotics

With our ecosystem, any teacher can confidently teach robotics—no programming background needed. In fact, your creativity and teaching skills may add more value than technical expertise alone.

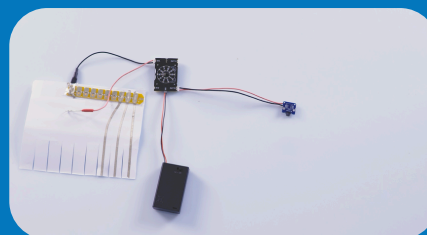
Non-technical teachers often bring a unique blend of creativity, critical thinking, and strong student engagement skills to the classroom. These strengths are just as vital as technical knowledge in robotics education, as they help create a more dynamic, inclusive, and inspiring learning environment where students can explore, experiment, and grow with confidence.



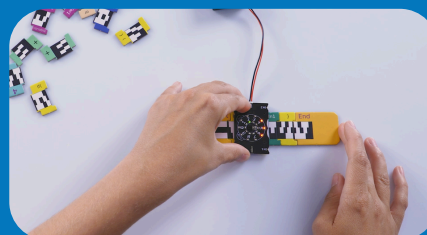
Why TokyMini Simplifies Classroom & Group Management

Flexible, Modular Curriculum with Fast Turnaround

- The TokyMini curriculum delivers a completed project every three sessions (approximately three hours of work).
 - This makes it ideal for after-school programs or robotics clubs, where new students may join at any time.
 - Each project starts fresh, eliminating the need for rigid progression structures—students can jump in at any time without feeling behind.
- ### Adaptive Learning for Mixed-Age Classrooms
- Students can take on individual challenges in programming, electronics, mechanics, and hands-on manipulation based on their age and skill level.
 - Even with students of **different ages sharing the same class**, each child can progress at **their own pace** while still collaborating and learning together.



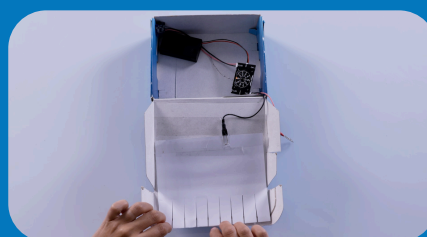
Electronics



Programming



Fun



Creativity and PBL

In Tokylabs trainings we help teachers implement a robotics program effortlessly with Tokymini, managing students more effectively, and creating an engaging learning environment that fosters curiosity, creativity, and problem-solving skills.

4.3 How any teacher can successfully make the switch, regardless of their technical background.

Here is the key message:

If you want to teach robotics in your new school using our system, you don't need any technical background. Our easy-to-follow methodology and curriculum will guide you step by step, enabling you to deliver exceptional lessons, even exceeding what most expect from a primary school robotics teacher. The best part? You don't need to dive deep into traditional programming. With just the bare foundations of coding, your students will develop basic computational thinking—and that's enough to get them started!

It might sound bold to say that learning traditional programming is no longer essential for a successful career in the future, but the industry is already proving this shift. Tech leaders are moving towards AI-assisted development rather than relying solely on human programmers. Just look at these recent developments:

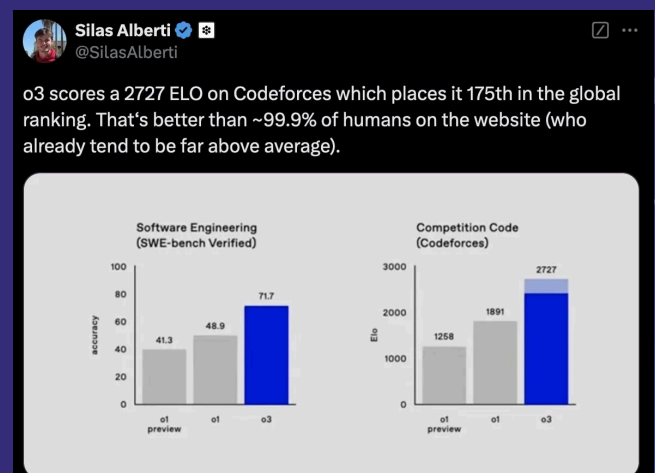
SALESFORCE WILL HIRE NO MORE SOFTWARE ENGINEERS IN 2025, SAYS MARC BENIOFF

[Link to the news](#)

MARK ZUCKERBERG STATED THAT AI AT META WILL SOON CODE AT THE LEVEL OF MID-LEVEL ENGINEERS, CHANGING THE ROLE OF TRADITIONAL SOFTWARE DEVELOPERS

[Link to the news](#)

OPENAI'S MODEL NOW RANKS AMONG THE TOP PROGRAMMERS IN THE WORLD, PROVING THAT AI CAN HANDLE COMPLEX CHALLENGES.

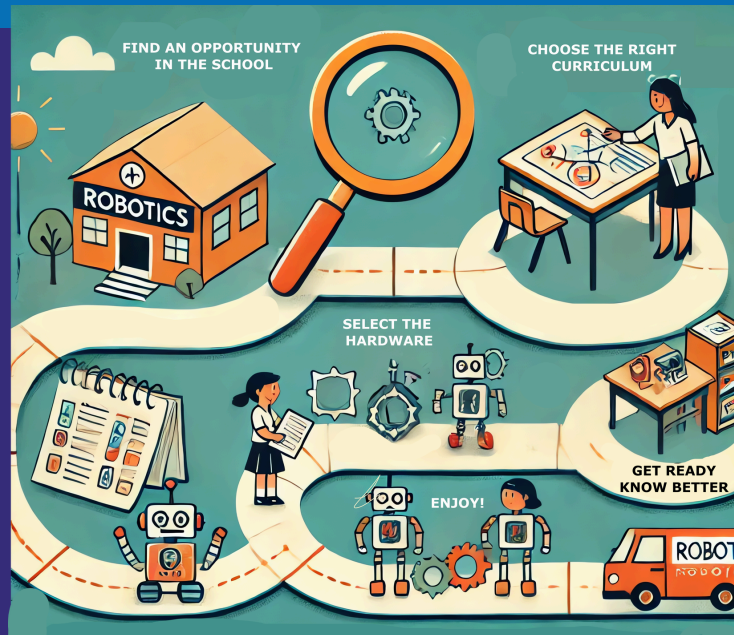


THAT IS WHAT WE TEACH WITH OUR METHODOLOGY IN JUST 5 WEEKS.

How to become a certified STEM robotics Teacher for primary school students and effectively implement engaging robotic projects that nurtures the right set of skills in the students for the future

CHAPTER 5

Roadmap to integrate robotics into your classroom



The 5-Step Plan:

- Identify the problem and opportunity
- Align with your school's approach
- Choose the right hardware kit
- Prepare smartly
- Have fun!

5.1 Finding the Problem and the Opportunity

Whether you're looking to certify yourself as a robotics teacher to increase your income, introduce robotics into your current school, find a new job faster, or simply explore a personal interest, the first step is to identify an environment in need of a proper robotics implementation. Schools that lack a structured robotics program often face challenges that can be turned into opportunities.

If you can clearly demonstrate how a fresh, modern robotics class can bring tangible benefits to a school, your chances of being promoted or hired as a robotics educator will significantly increase. Recognizing the gaps in existing programs allows you to position yourself as a solution provider, rather than just another teacher seeking a role.

This chapter outlines a five-week, five-step plan to confidently introduce or improve robotics in your classroom, ensuring a smooth and engaging experience for you and your students.

Every school is different, but here are some examples of Key Scenarios to Look For:

ICT Misrepresented as Robotics:

Some schools mistake ICT (Information and Communication Technology) for robotics, offering basic computing lessons instead of hands-on engineering and programming. This often happens because they lack qualified robotics teachers and rely on general IT instructors to fill the gap.

STEM Programs Overloaded with Science, Lacking Engineering & Technology:

Many STEM curricula focus heavily on science experiments, leaving out the core engineering and technology aspects. This results in a disconnected STEM experience, where students miss out on learning about automation, programming, and robotics applications.

Robotics Restricted to Middle School Due to Lack of Awareness:

Some schools only introduce robotics in middle school, assuming younger students cannot engage with robotics due to screen-based coding requirements. They may not be aware of screenless robotics solutions like TokyMini, which allow primary students to develop problem-solving and engineering skills without needing advanced literacy or coding experience.

Current scenario

80% of high school graduates are NOT prepared for college-level STE majors.
Less than 50% of Schools in the US offer computer science classes.
Lower STEM education quality reduces innovation and economic growth.

5.2 Understanding the approach of your school and find a suitable curriculum

Schools teach robotics differently based on their vision and resources. Aligning your school's values with your robotics approach is key.

As a reference, here is the generic tables of models and methodologies to approach to robotics in education:

Approach	Learning Style	Structure	Assessment	Ethics & Global Awareness	Time Frame	Interdisciplinary Learning	Student Autonomy
PBL (Project Based Learning) – Core Method for TokyLabs	Hands-on, real-world problem-solving	Flexible, student-driven projects	Prototypes, demonstration teamwork reflections	Encourages solving realworld problems through robotics	Typically semester- or year-long projects	Strong STEM integration, aligned with SDG topics	High. Students create solutions independ
Inquiry-Based Learning & Socratic Dialogue	Question-driven, exploration focused	Open-ended questioning, teacher as a guide	Reflections, group discussions, project work	Encourages deep questioning and discovery in robotics	Semester or ongoing	Strong in STEM, philosophy, and problem-solving	Very high (students and answer their own question)
STEM & STEAM-Based Robotics	Integrated with Science, Technology, Engineering, Math	Part of a structured curriculum with room for creativity	Play-based projects, functional prototypes	Encourages responsible tech use and sustainability	Semester- or year long integration	Strong links with creativity arts,	Medium (guided exploration with open ended results)
Maker Education	Hands-on, experimental or directed learning	Open-ended, creative exploration	Play-based projects, functional prototypes	Often includes themes like recycling and sustainability	Continuous, varies per school	Engineering arts, and hands on science integration	Very high (child-led discover)
Play-Based Robotics	Play-driven, exploratory learning	Unstructured or lightly guided play with robots	Observational assessment, storytelling, creativity based tasks	Not heavily focused on ethics but introduces collaboration	Ongoing	Integrated with early childhood education, storytelling	High (students experiment freely)
Socially Responsible Robotics & Ethics	Ethics-focused social problem solving	Project based with real-world themes	Case studies, storytelling, class discussions	Focuses on kindness, fair use, and sustainability	Semester- or year-long	Strong ties to environmental education, empathy	High (students investigate simple questions)

TokyLabs offers a comprehensive 5-week training program to become a certified STEM Robotics teacher for primary school. This training includes not only expert-led instruction but also a complete, ready-to-use curriculum designed for seamless classroom integration.

With step-by-step tutorials, student-centered materials, and engaging hands-on projects, you'll have everything you need to confidently teach robotics without the hassle of designing lesson plans from scratch. Our program ensures that you can focus on teaching and inspiring students, while we provide the structured resources to support your success.

5.3 Selecting the Right Hardware Kit for a Successful Robotics Curriculum

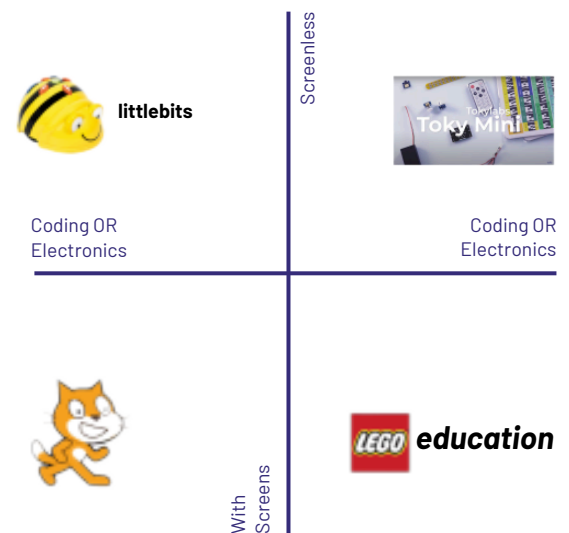
Once you have determined the approach to robotics that best fits your school and outlined the types of projects you want to teach, the next step is selecting a robotics kit that aligns with your curriculum. The right hardware should include all the essential components needed to deliver engaging, hands-on lessons while ensuring smooth classroom implementation.

While many robotics kits exist on the market, very few are suited for primary schools, and most fail to offer a screen free experience that is both effective and developmentally appropriate for primary school students. We recognize the need for young learners to engage with tactile, hands-on STEM education without excessive screen time.

5.4 Get Ready, know better.

Alright, by now you've likely explored various alternatives, and if you're still with us—even for a little longer—we truly appreciate it. Thank you for giving us the benefit of the doubt.

Landscape in Hardware: Tokymini



Tokymini has an open-ended curriculum that sets the foundations of robotics and STEM with coding and electronics
Tokymini is 100% screenless and unplugged device, allowing a healthy development of the eye sight.

Fortunately, we are providing you in this book an all-in-one solution, seamlessly integrating curriculum and hardware into a single package. This eliminates the challenge of searching for compatible kits, testing different products, and risking an incomplete or ineffective implementation. TokyLabs is the only solution that fully embraces this healthy, screen-free approach, ensuring that students can develop problem-solving, engineering, and computational thinking skills in a natural, interactive way

This is the most decisive step in the process: receiving certified training that aligns with the job you're aspiring to. As we discussed in the Microcredentials chapter, pursuing another university degree is not necessary to achieve longterm career benefits. Instead, the key is to find a fast-track solution that equips you with the right knowledge, ready to-use materials, and a structured curriculum—allowing you to confidently start teaching robotics at any time. Most importantly, this training should be backed by a recognized brand, ensuring credibility and increasing your employability in the education sector.

At TokyLabs, we are ready to take this journey with you. In our certified training programs, we don't just hand you a set of videos and leave you on your own—we promise to stand by your side with unlimited LIVE training sessions and ongoing support until you feel fully confident to teach robotics independently. This is not just another online course; it's a true partnership and a commitment to our growing community of educators. For us, your success is non-negotiable. Can you imagine training teachers without ensuring they are fully prepared and capable? That would be a short-lived vision—and that's not how we operate.

BOOK YOUR SESSION HERE:

As a thank-you, enjoy a free 1-on-1 session with us to explore your needs, see our kits in action, and get personalized guidance for your robotics journey.

<https://cal.com/tokylabs/45min>



5.4 Get Ready, know better.

You've done it—you've gone through the steps, prepared yourself, and now it's time to enjoy the journey with your students. Pick exciting projects from our curriculum, engage with the online community of teachers, and celebrate both your successes and challenges. Share your tips, tricks, and experiences, because every insight you provide helps shape a stronger, more connected robotics education ecosystem.

At the end of the day, this is what it's all about—seeing the intellectual joy in your students as they realize they can do things that once seemed impossible. Watching confidence grow as they discover their ability to create, innovate, and think critically. Witnessing that moment when a child feels truly empowered, knowing they can shape, improve, and build something real.

This is why we do it—and I hope you experience that amazing feeling too.

5.5 Enjoy!

You've done it—you're ready to start this exciting journey with your students. Explore fun projects, connect with other teachers, and share your experiences to grow the robotics community. Most of all, enjoy the joy and confidence in your students as they realize they can create, innovate, and build what once felt impossible.

CONCLUSION

Your Future as a Robotics Educator

As we reach the conclusion of this guide, it's time to reflect on the transformational journey into robotics education. Whether you are looking to future-proof your career, enhance your teaching methodologies, or take advantage of the growing demand for STEM educators, making the shift to screen-free robotics teaching is a step toward professional growth and long-term job security. Robotics teaching empowers both students and teachers, fostering an environment where creativity, critical thinking, and hands-on learning come together to create a more engaging classroom experience. The demand for qualified robotics educators is increasing, and by upskilling now, you position yourself

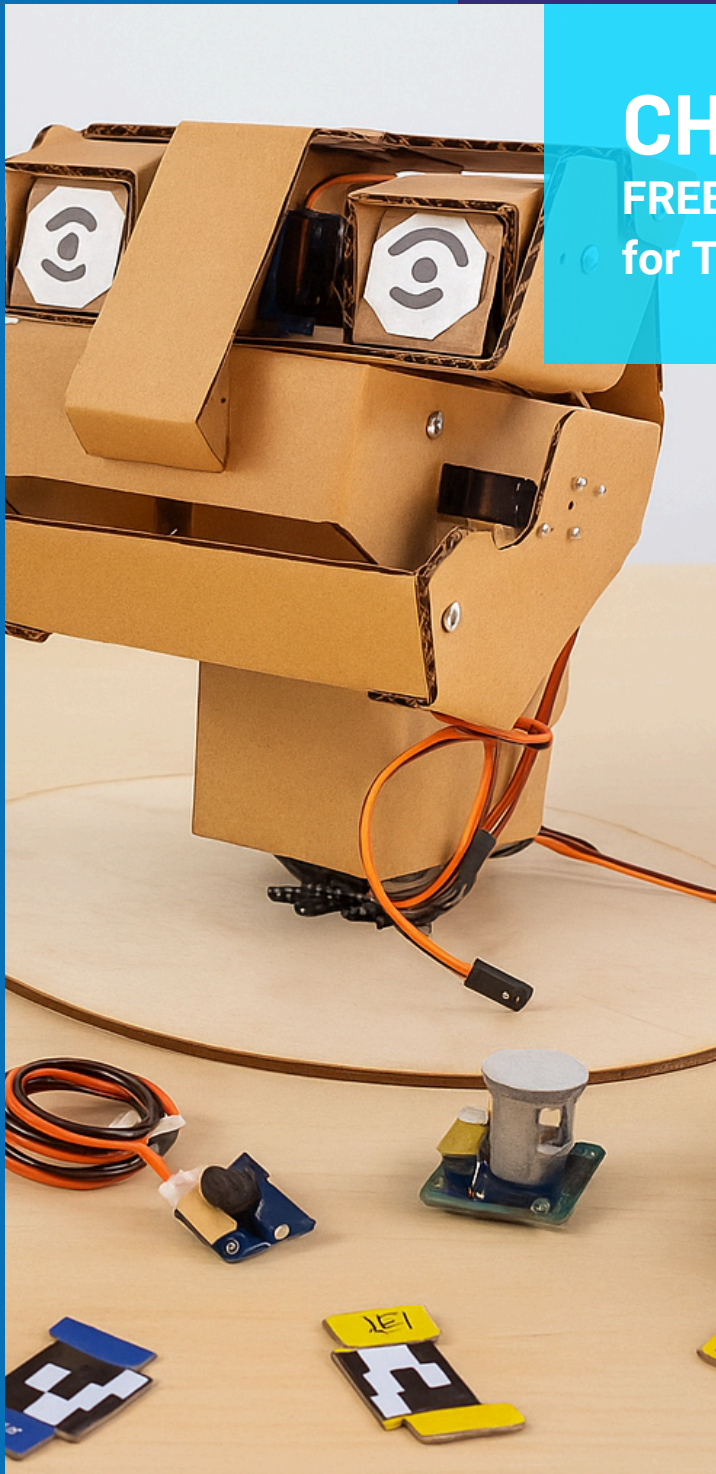
at the forefront of one of the most in-Demand educational fields of the future. At TokyLabs, we have designed an accessible, intuitive, and highly effective way to teach robotics without requiring a background in programming or engineering. Our training provides a structured curriculum, hands-on robotics kits, and ongoing support to ensure you can seamlessly implement robotics in your classroom. By embracing this screen-free, hands-on approach, you equip your students with essential problem-solving skills while securing your own position in an evolving job market. Schools, EdTech companies, and even private institutions are actively seeking robotics educators, and TokyMini offers you the perfect starting point to enter this high-demand sector.



CONCLUSION

CHAPTER 7 (BONUS):

FREE Practical Resources and Ideas for Teachers



In this chapter we will give you some resources to start promoting a healthy and balance learning of STEM + soft skills. You will find some templates to build simple cardboard robots. Of course some letters of STEM are missing here, since programming or electronics are not present in these robots. Nevertheless it is an open gate for further exploration from your end that hopefully end one day in including our complete methodology with tokymini robotics kit.

7.1 Animated Cardboard templates

[Click in this link to download it.](#)

7.2 Tools and Curriculum to have age & level difference in the same classroom

We have adopted and customised a very smart system from LOFI ROBOT (17) (huge thanks to Maciej!) that allows us to use the same projects in the classroom while easily adjusting them for all skill levels—without adding extra work for the teacher.

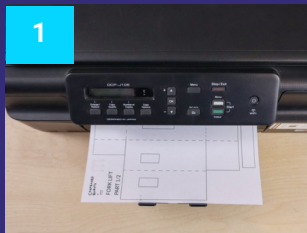
Early Years of Primary School

Young primary school students may struggle with tasks like measuring, drawing precise dimensions, and building based on a 2D blueprint. It's also important to consider the tools they feel comfortable using for assembling, cutting, and gluing. For safety reasons, tools like hot glue guns and cutters should be avoided. Instead, materials and tools should be adapted to their needs. For example, scissors should have larger handles to fit multiple fingers and shorter blades to create more leverage, making cutting easier.

Here are three key guidelines to follow:

- They can use a printed template to cut out shapes with adapted scissors instead of drawing the design directly onto the cardboard. Cutters should not be used.
- Screwdrivers are used just to poke holes.
- Instead of nuts and bolts, they should use glue sticks and Blu Tack to attach pieces together.

Print the design in a A4 Sheet



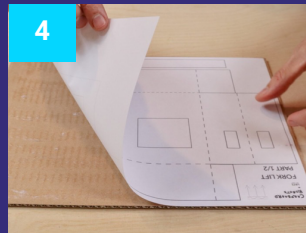
Print the design in a A4 Sheet



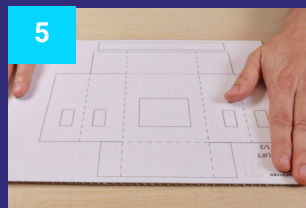
Prepare cardboard sheet and cover it with paper glue



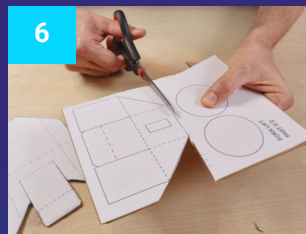
Prepare cardboard sheet and cover it with paper glue



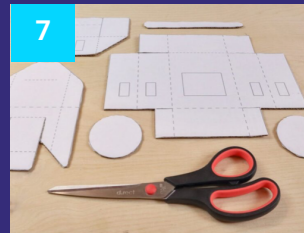
Glue printed cardboard robot template to the sheet



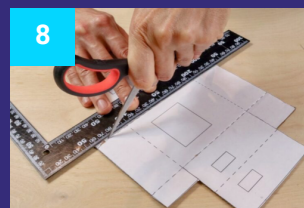
Smooth out the surface of the glued robot template



Pre-cut all the parts from the sheet



Precisely cut out all the robot parts along solid lines



Use scissors to trace bending lines along dashed lines



Use the screwdriver to make holes in the corners



Use scissors along with ruler to trace holes for servo motors on both sides of the cardboard



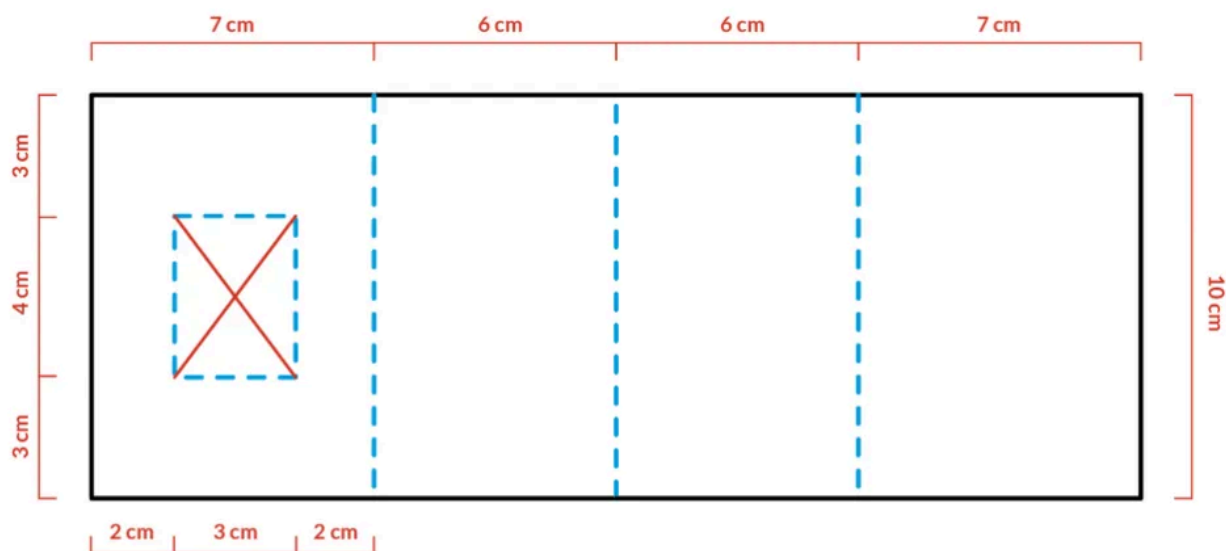
Gently remove inner element from cut out hole

Late Years of Primary School

Older primary school students have better dexterity for designing, drawing, and measuring, as well as a stronger ability to visualize how to build from a 2D blueprint. They can also handle more complex tools, such as screwdrivers, nuts, and bolts. Here are three key guidelines to follow:

To adapt activities to their skill level, we follow these two main guidelines:

Students receive a 2D printed blueprint with measurements and must draw the design directly onto the cardboard using pens, rulers, etc. They can then cut the parts with larger scissors or, if age-appropriate, a cutter. Whenever possible, students should avoid glue and instead use nuts and bolts to join pieces. This approach provides a more authentic experience with mechanics and robotics.



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TESTIMONIALS

Please follow the following link to have access to community member's video playlist who have experienced our methodology, from the perspective of a students, parents, teacher and education centres.

[CLICK HERE](#)



MEET OUR CEO

“Motivation is a conscious mental state”

Eduardo Alarcón is the Founder and CEO of TokyLabs, the Edtech company who created an innovative STEM Robotics tool and methodology for total beginners that it's changing the way students and teachers approach technological innovation. Eduardo is also Maker, Stakeholder of XinChejian (First Hackerspace in China), TEDx Speaker and former Participant of NASA Space Elevator beam power challenge. With over a decade of experience in robotics education, Eduardo learned the hard way—making countless mistakes along the journey. Determined to bridge the gaps in learning, he founded his own robotics company, gaining firsthand insight into the real challenges faced by beginners.

After working with institutions, educators, and makers worldwide, he realized that accessible, streamlined courses were essential to overcoming learning barriers and achieving results faster. Now, through his training programs, he distills years of experience into practical, hands-on learning, accelerating the careers of aspiring robotics professionals across the globe. He also holds six years of experience as researcher at Universitat Politecnica de Catalonia in Spain, where he designed and implemented a multi-model power system for researching on Smart microgrids. Before moving to Shanghai, Eduardo designed Smart Bank, a fin-tech management platform for banks and financial institutions capable of categorizing and visualizing user transactions as well as making recommendations. He has seven publications in some of the top international scientific magazines to his name on topics ranging from static synchronous compensators to the NASA space elevator. He speaks five languages and has travelled to more than 45 countries.