White Paper

Identifying Coding Robots for Different Learning Environments

iRobot™

Education

Introduction

Before the pandemic, online learning was experiencing increasing growth and interest. Faced with the need to transition away from traditional in-person learning environments, online learning has now become the new normal. According to the United Nations 2020 Policy Brief: 94% of learners are facing disruptions to their learning environments due to the COVID-19 pandemic, affecting nearly 1.6 billion learners globally.[1]

While some schools are able to maintain in-person, the majority are transitioning toward remote learning or hybrid learning. In some cases, the decision is taking place on a weekly basis; guided by public health recommendations. As it stands, it is unclear when and whether learners will ever return to brick-and-mortar schools full-time. What we do know, is the following:

- Instructional settings are fluctuating between in-person, remote and hybrid learning models.

- Educators are having to retrofit lessons to support distance learning, a challenge that is only amplified by the absence of supporting tools or materials.

- It is becoming increasingly challenging for educators to engage learners digitally.

- In addition to setbacks in academic learning, learners are also experiencing gaps in social-emotional learning.

- When the time comes, the readjustment to in-person learning will be difficult.

These challenges highlight a problem that is not new but has seldom needed to be addressed before now: Educators need access to tools that can transition across learning environments.

Meeting Educators in the Moment—and Beyond

Given the new demands that educators are facing, it is critical for them to have access to the tools that will meet them in the moment and enable their success. Tools that can be adapted across learning environments empower educators to not only deliver consistent learning experiences but also provide them with a unique opportunity to plan for future needs and challenges. In turn, providing educators with the what they need to do their job effectively helps strengthen the resilience of the education system to support educator readiness and better position instructional flexibility across learning environments.

1. United Nations, "Policy Brief: Education During COVID-19 and Beyond," August 2020, www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2020/08/sg_policy_brief_covid-19_and_education_august_2020.pdf.
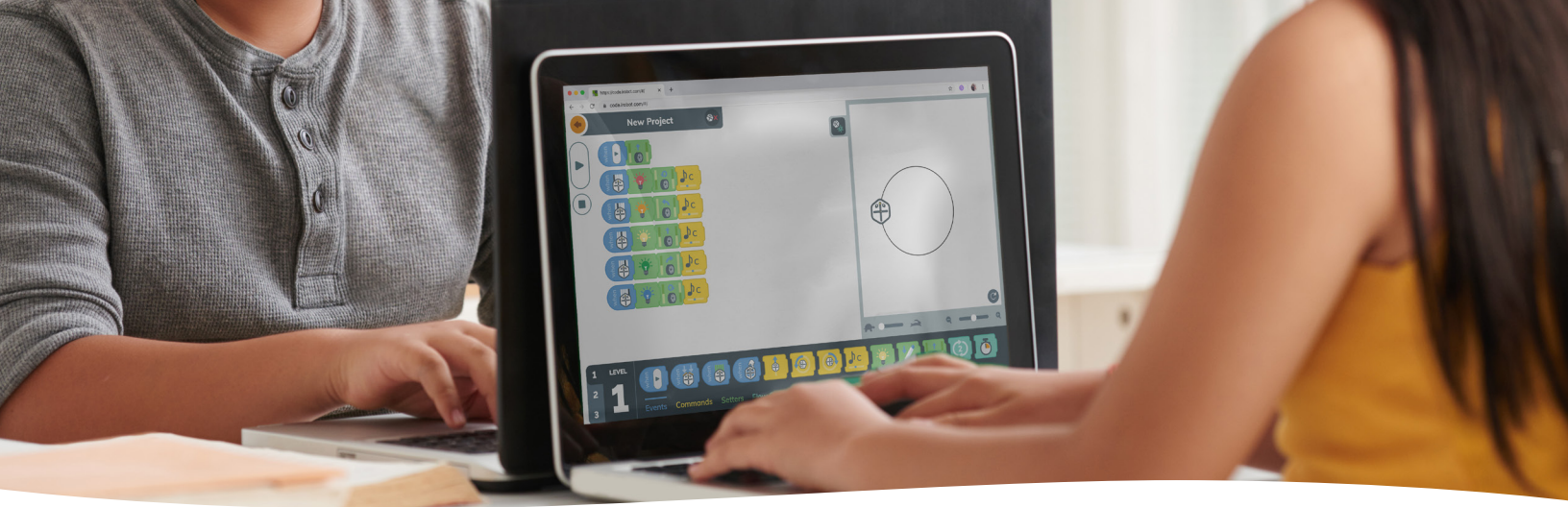
Why Coding Robots?

Educational coding robots serve as powerful teaching tools that engage and motivate learners in novel ways. Complementing the roles of educators, coding robots provide opportunities to scaffold and differentiate lessons to deliver learning in ways that resonate with every learner. Not only instrumental in teaching computer science and digital literacy, coding robots enhance other subjects as well, forming a framework of knowledge learners can build upon.

Seeking Versatile Coding Robots for Use Across Learning Environments

At their best, coding robots bring code to life through interactive, hands-on lessons. However, their value does not stop there. There are a number of coding robots available that allow educators to not only take on challenges with real-life robots, but also their virtual counterparts. This mean that no matter the learning environment, educators can use these tools to engage, connect with and teach learners; all while supporting continuous learning opportunities.

In the search for coding robots that can transition across learning environments, look out for those that offer:

- **Simulator Environments:** Choosing a coding robot that connects to an app with a built-in simulator environment make it possible for learners to program virtual robots for an entirely remote learning experience; with the ability to demonstrate their learnings on real robots when they return to the classroom.

- **Multiple Learning Levels:** Coding robots that feature multiple tiers of coding languages enable educators to differentiate their instruction and encourage self-directed learning by allowing learners to work between levels on each lesson. This also means that as learners' progress from one level to the next the robot is able to advance with them, providing a broader reach across learners' ages or skill levels and a greater return on investment.

- **Code Conversion Across Levels:** Facilitating opportunities for educators to support their learners, coding robots that let learners switch code back-and-forth across levels make it easier to: form connections between concepts, build onto existing programs and launch new lessons from prior knowledge.

- **Project Sharing:** Sharing projects using a unique code not only provides a great way for learners to turn in their assignments,
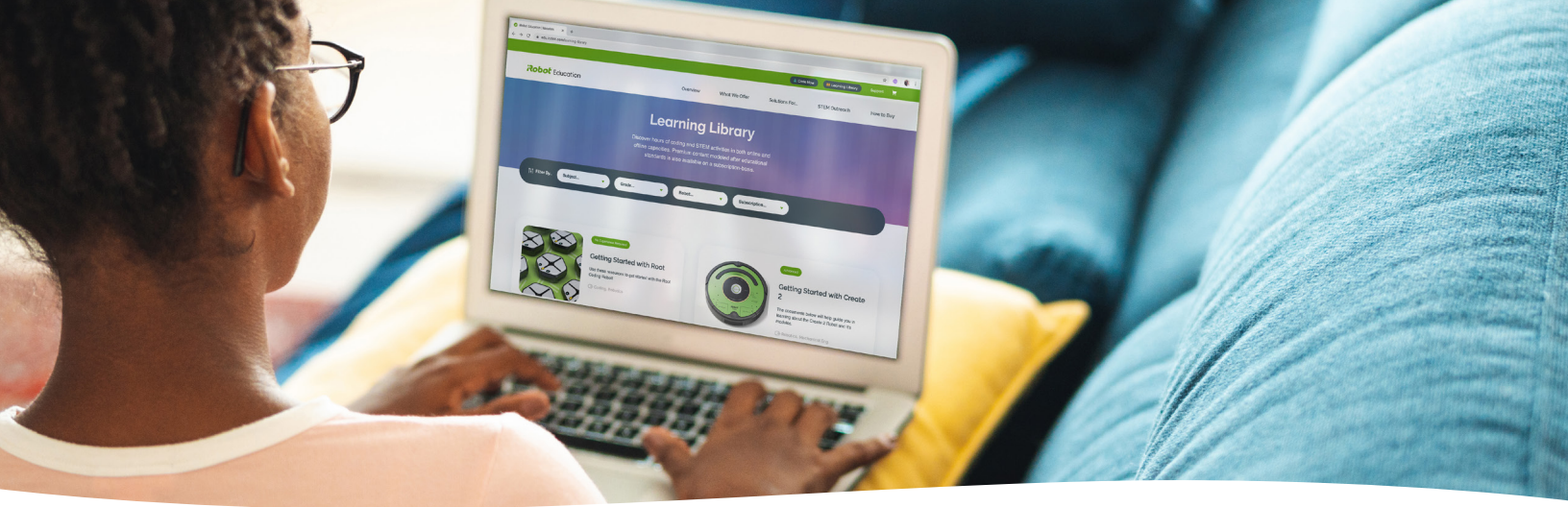
but also provides a pathway for learners to collaborate virtually. Using project codes, learners can take turns contributing small pieces of code to a single program in order to reach a certain outcome; giving them the opportunity to recognize the ideas, experiences and opinions of their peers—building social-emotional learning skills.

- **Cross-Platform Support:** Not all coding robots are controlled by apps that are accessible across different operating systems. Apps featuring cross-platform support allow learners to code their programs using different models of devices, overcoming common barriers for using technology at school or at home.

- **Learning Content:** Investing in a coding robot backed by learning content gives educators the guidance they need to get started. Learning content supports educators by providing them with a natural sequence of tutorials, projects and activities that can be merged into the curriculum, or by providing them with the inspiration they need to create their own lessons.

- **Professional Development Opportunities:** Not all educators know how to get started with coding, especially when challenged

with integrating it into remote or hybrid environments. Coding robots that offer resources to support educators, whether in the form of instructional guides or professional development opportunities, will make the roll-out easier by increasing educators' confidence and readiness.

Meet the Root® Coding Robot

Recognizing the need for digital literacy, the Root® coding robot uses in-person or virtual experiences to teach coding and strengthen computational thinking skills. Its combination of features and sensors provide a unique avenue for learners to bring code to life and connect their classroom learning with the real world.

Powered by the iRobot® Coding app, the Root® coding robot harnesses the versatility of Auto-Level Conversion to translate code between 3 Learning Levels and advance alongside learners, no matter their skill-level. Featuring a simulator environment where learners can control a virtual Root® SimBot, the Root® coding robot has educators and learners covered for a seamless transition between virtual and in-person learning.

- **Distance Learning:** The Root® coding robot's companion iRobot® Coding app is designed for coding, exploring and learning at home!

When the time comes, learners will be able to continue their learning in the classroom with their real Root® coding robots.

- **In-School Learning:** Abide by social distancing best practices while using tangible, hands-on experiences to teach coding and strengthen computational thinking skills. Dividing learners into small groups with a shared robot, learners can work on their individual devices before connecting with the robot and taking turns watching their code come to life!

- **Hybrid Learning:** Making it easy to bring classroom learning into the home, learners can access the iRobot® Coding app at home to practice their coding skills before returning to the classroom and sharing their discoveries (while physically distanced!)

Conclusion

Educators need access to tools that will meet them in the moment—and that will seamlessly transition across instructional settings to promote continous learning. With over 30 years of experience building and programming robots, iRobot provides the trusted, versatile Root® rt1 coding robot that supports educators in any environment: with a deep understanding of learners' needs. Access to a simulated coding environment makes it possible to transition across in-person and distance learning, with learning content designed to make coding accessible for educators and learners alike. Professional development opportunities help educators get started and instill the confidence they need to integrate coding into their in-person, hybrid or remote classrooms. Plus, overcome a frequent barrier to beginning with new technology by using the app right away, then rolling out the robots once the purchase process is completed.

About the Root® Coding Robot

Born at a distinguished cross-disciplinary research institute and adopted by iRobot, the Root® coding robot is practical tool for teaching progressive coding skills. Dedicated to using robots to empower the next generation of innovators, iRobot is focused on expanding the Root® coding robot's portfolio to amplify learners' access to STEM education.

Visit edu.irobot.com to learn more!