

A Guide to K-12 Virtual Robotics in Education:

# How to Select a Gamified Computer Science Platfrom

#### Introduction

Today's students must be prepared to thrive in a digitally connected world and workforce with constantly evolving technology. As educators integrate computer science skills into their curriculum, many have chosen to "gamify" their lessons by incorporating game-based elements like scorekeeping, teamwork, and competition to increase student engagement and streamline the learning process. However, not all gamified computer science platforms are built with the same student goals or educational outcomes in mind. This guide is designed to assist educators in evaluating gamified coding platforms as a .whole school computer science curriculum





#### **Benefits of Gamified Learning**

According to the **Nation's Report Card**, less than half of students in the United States met the performance indicators of "proficient" or "advanced" in science, math, technology, and engineering literacy. The main goal of gamified education is to focus on problem-solving **skills**, foster creativity, and encourage collaboration through hands-on learning opportunities. Educators understand the importance of creating STEM learning environments that are both inviting and accessible to all K-12 students, regardless of age or background.

#### Gamification in education offers a variety of benefits to both staff and students:

Energizes classrooms by giving students new pathways for STEM learning with a standards-aligned experience.

- Allows for STEM integration into existing curriculum and district initiatives.
- Offers personalized pathways to support all learners through **differentiation**.

Allows for multiple learning styles that facilitate creativity, collaboration, communication, critical thinking, and computational thinking–essential college and workforce skills.

#### **Criteria for a Successful Program**

To select the best STEM programs, they need to consider three critical pillars within the overall scope of specifications: **Flexible Curriculum, Robust Technology,** and **Tiered Support.** A strong program can balance its capacity to deliver on all fronts.

#### Considerations for Choosing a Gamified Platform

### What are your age, grade level, and content focus?

Whether your school is looking to adopt a gamified platform for multiple grades or content areas or just one classroom, all students can benefit from gamified computer science platforms. Some platforms are specifically designed for STEM (science, technology, engineering, mathematics) courses, but options are not limited to just those subjects.

## What technology tools are necessary to implement the platform?

Chromebooks, and mobile devices are ubiquitous in 21st-century classrooms and support student learning. Depending on your school's technology infrastructure, find gamified programs that can be accessed through existing devices with little to no cost-prohibitive hardware.

## What technology training and support do students and teachers need to be successful?

All members of the educational community should feel comfortable and confident engaging with the gamified learning platform. Ease of operation is achieved with robust professional development opportunities for staff and intuitive technology tools integrated throughout the program.



#### Flexible Curriculum Criteria

CONTENT	<b>YES</b> Product contains	<b>NO</b> Product does not contain
Cloud-based delivery for easy browser access from school or home.		
Easily implemented in various learning situations (in-person, hybrid, remote) and supports learning in nontraditional settings.		
Provides options to differentiate for learners of all levels.		
Program content is aligned to local, state, and national learning standards and CSTA and NGSS Engineering Design Standards.		
Content fun and engaging for students.		
Lessons motivate students and encourage consideration of STEM careers.		

#### **Robust Technology Criteria**

PLATFORM	YES Product contains	<b>NO</b> Product does not contain
Single sign-on with Classlink, Google, and Clever for fast, easy access.		
Scalability that meets the needs of all learners in any size learning organization without depending on cost-prohibitive hardware.		
Provides real-time progress/results for staff and students.		
Strict adherence to privacy and security protocols.		

### **Tiered Support Criteria**

PLATFORM	YES Product contains	<b>NO</b> Product does not contain
Provide teaching guides, structured lessons, and content resources.		
Professional development is embedded into program training or is available on-demand.		
Staff and students can track progress and skills achievements.		

### Defining Critical Teaching and Learning Specifications

Having looked at the three pillars of a practical computer science platform, education leaders searching for a robust computer science program can take a deeper look at what defines effectiveness in the context of teaching and learning.

### Integrates into any STEM and computer science curriculum.

A gamified computer science platform can support inquiry-based or project-based learning. It can also upgrade computer science classes with the latest technology and increase student engagement in STEM through gamified experiences. Resources such as curriculum alignment and pacing guides, support resources, and assessment opportunities empower teachers to promote digital literacy and STEM careers.

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#### Competition activities allow students to test their skills and compete against classmates or peers in other classes or schools.

Friendly competitions allow students to work collaboratively in teams in a sports-like atmosphere to demonstrate their computer science abilities. Students of all ages and abilities can collaborate and bond over shared interests. Through these events, students practice computational thinking, self-directed learning, creative problem solving, time management, digital literacy, and teamwork—all skills that will serve them well in college and career.

### Maintains industry and educational partnerships with organizations.

Students need expertise in cutting-edge computer science to be competitive in the evolving 21st-century career field. It is essential to ensure STEM and computer science curriculum remain current and continues to meet educational standards as technology progresses. Seek computer science vendors who maintain relationships with professional organizations, such as **Computer Science Teachers Association** or the **International Society for Technology in Education**, and are committed to adapting as technology evolves.

### Accommodates accessibility with resources for all learners.

Content is differentiated to allow students to participate in authentic learning experiences and work towards mastery while solving real-world challenges. Focusing on computer science skills helps bridge academic achievement and opportunity gaps. Students can either collaborate or work alone promoting out-of-the-box thinking and soft skills. There is real-time feedback for both students and teachers and includes differentiated tasks that appeal to a wide range of skill levels.



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Use this guide as you evaluate computer science programs that serve the specific needs of your learning community. One of the essential requirements for all content platforms is supporting students and teachers, regardless of their learning platform. Schools and districts want to have confidence in their vendors and partners. These best practices will help you make the right decision for your staff, students, and community stakeholders.

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