

Urban Arts' Game On:

Developed and Validated Through
Iterative Research with Real Users

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Research Synthesis

Abstract

Game On is a full-year College Board–endorsed Advanced Placement Computer Science Principles (AP CSP) course developed by Urban Arts in which students learn computer science by designing and programming original video games using the Unity game engine. Supported by a U.S. Department of Education Education Innovation and Research (EIR) grant, the project combined curriculum development with a multi-year research agenda conducted by WestEd to examine usability, feasibility, and early evidence of promise. Between 2022 and 2025, WestEd conducted a series of iterative studies with teachers and students in classroom settings. Findings informed ongoing refinements to curriculum materials, professional learning, and technical supports, while demonstrating strong student engagement and positive teacher perceptions of the program's instructional value. A February 2026 survey of Game On teachers further examined readiness for scale and found consistently reliable implementation experiences, alongside the need for additional program support to prepare schools for the technology infrastructure required to operate Game On. WestEd is currently conducting a quasi-experimental study during the 2025–2026 school year comparing Game On classrooms with business-as-usual AP CSP instruction across 23 schools. Together, these studies document the program's progression from an early prototype into a classroom-ready curriculum positioned for broader implementation and rigorous evaluation of its potential to improve computer science learning outcomes through game design.



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Introduction

In January 2022, Urban Arts was awarded an Education Innovation and Research (EIR) grant from the U.S. Department of Education to develop and evaluate Game On, an AP Computer Science Principles (AP CSP) course in which students learn to code by creating their own video games in the Unity platform. The course is grounded in Urban Arts' evidence-based School of Interactive Arts (SIA) model, now called Game Academy, which has been implemented for over a decade within Urban Arts' New York City-based after-school and summer programs.

Building on this foundation, the EIR project focused on developing a related but distinct program called Game On, designed for implementation as a full-year, classroom-based AP CSP course in high schools nationwide. The goal was not simply to adapt an after-school model for classrooms, but to employ an iterative design-based research process to study and refine a curriculum that could be implemented by teachers with varied backgrounds, across diverse school contexts, and sustained at scale. Unity partnered with Urban Arts to support the integration of the Unity game engine into the curriculum, ensuring that students engage with industry-relevant tools while participating in authentic game design and development.

To ensure that Game On was not only innovative but also usable, feasible, and instructionally sound in real classrooms, Urban Arts partnered with the nonprofit education research organization WestEd as the project's independent evaluator and research partner. Together, they designed and implemented a multi-year, iterative research agenda aligned with a developmental and design-based research paradigm. This agenda embedded cycles of formative study and user feedback into the development process, examining teacher professional learning, curriculum usability, classroom implementation, student engagement, and the technical and instructional supports needed for effective use. Across studies, design decisions were driven by evidence from real teachers and students in authentic classroom settings, positioning research as a core driver of continuous improvement rather than a post hoc validation exercise.

Between 2022 and 2025, WestEd conducted four sequential studies, progressing from early usability testing to demonstrations of feasibility and initial promise, and guiding Game On's evolution from an early prototype informed by an after-school model into a classroom-ready AP CSP course designed for use across diverse high school settings. This Research Brief provides an overview of those four studies and how each contributed to strengthening Game On's readiness for broader implementation and subsequent effectiveness testing.

The Research Brief also incorporates findings from a recent study conducted by Edward Metz in February 2026. This survey of Game On educators examined readiness for scale from the perspective of teachers who used Game On, focusing on their experiences implementing the program and the conditions necessary for broader adoption across diverse school settings. Finally, the brief describes an ongoing quasi-experimental study being conducted by WestEd as the culminating research activity under the EIR grant. This study is designed to estimate the effects of participation in the Game On course by comparing outcomes for students enrolled in the program with those of similar students who did not participate during the same school year.

Study 1. Spring 2022 Usability Study: From Concept to Classroom-Ready Beta

Purpose and Design

WestEd's September 2022 report presented findings from a spring 2022 usability study of the initial Game On module. The purpose was to examine early usability and determine whether teachers and students could navigate the lessons, tools, and materials as intended, and whether initial design barriers could be identified prior to broader classroom use. The study employed a qualitative design using think-aloud protocols, structured observations, and focus groups.

The sample included four teachers and nine students, all of whom had prior experience with Urban Arts' School of Interactive Arts program. Participants took part in three one-hour usability sessions in which teachers led early prototype Game On lessons with small groups of students while verbalizing their thinking. WestEd researchers observed sessions both in person and remotely via video recordings. Follow-up focus groups with teachers and students captured perceptions of engagement, challenges, and recommendations for improvement.

Findings and Contribution to Game On's Development

WestEd reported that teachers and students were highly engaged and enthusiastic about the Game On prototype, supporting the program's core premise that game-based creation using Unity could motivate participation in AP CSP content. Participants described the materials as rich and motivating, particularly the hands-on activities and integration of the Unity platform.

At the same time, the study surfaced important usability challenges, including technology setup complexity, navigation across multiple tools, lesson pacing, and the level of preparation required for teachers. WestEd recommended stronger integrated technology supports, clearer "preparing for the lesson" guidance, more realistic instructional pacing, facilitation prompts, and structured opportunities for collaboration and productive struggle. These findings directly informed revisions by Urban Arts to lesson plans, teacher guides, and technical resources, moving Game On from an early concept toward a classroom-ready beta grounded in direct user feedback.

Study 2. Fall 2022 Early Teacher Experience: Validating Professional Learning and Initial Use

Purpose and Design

WestEd's report on the fall 2022 study presented findings examining teachers' early experiences after completing Game On professional learning (PL) and implementing the course for approximately three months. The study focused on teacher readiness, early classroom use, and areas requiring refinement. Using a qualitative design, WestEd conducted observations of selected PL sessions delivered over Zoom and follow-up interviews with teachers from the first cohort who participated in Urban Arts' summer PL and began teaching the curriculum in fall 2022.

Findings and Contribution to Game On's Development

Teachers consistently described the PL as high quality, engaging, and supportive, particularly in helping them learn Unity and understand how the curriculum components fit together. Teachers reported strong early student engagement and noted that Game On provided a clear instructional structure for teaching AP CSP content. Several teachers described Game On as more engaging than other AP CSP curricula they had previously used, reflecting perceived improvements in student motivation rather than comparative impact evidence.

Teachers also identified areas for refinement, including the need for more differentiated PL based on prior Unity experience, additional lesson modeling, stronger support for unplugged activities, clearer processes for resolving technology issues, and expanded opportunities for teacher collaboration. These findings confirmed that the PL model and curriculum structure were usable and valued, while directly informing Urban Arts' updates to PL materials, the addition of differentiated supports, the creation of a collaborative online teacher community, and the strengthening of technology troubleshooting resources—enhancing Game On's feasibility for teachers.

Study 3. Fall 2023 Curriculum Quality and Classroom Feasibility: Demonstrating Cross-Context Usability

Purpose and Design

WestEd’s September 2024 report presented findings from a fall 2023 feasibility study examining the feasibility of sustained classroom use of the Game On curriculum in authentic AP CSP settings. The study used a mixed qualitative and descriptive design, including teacher surveys, student surveys, student focus groups, and teacher interviews, to examine curriculum usability, instructional flow, student engagement, alignment with core CS concepts, and teacher implementation. The sample included three AP CSP teachers and 33 students.

Findings and Contribution to Game On’s Development

WestEd found that Game On was feasible for classroom use across varied settings, with teachers able to implement the curriculum while making context-specific adaptations. Teachers reported that the curriculum provided a coherent structure for teaching AP CSP concepts and that students were highly engaged, particularly through Unity-based game development and project-based learning.

Descriptive post-test results indicated that students demonstrated understanding of core computer science concepts, with average performance of approximately 80% on variables, 76% on conditionals, 83% on loops and iteration, and 62% on algorithms. These results were descriptive benchmarks rather than causal estimates of impact. The study also identified areas for continued refinement, including pacing across units, clarity of learning objectives, alignment between unplugged and coding activities, and the need for additional scaffolds and exemplars to support diverse learners. These findings informed post-study refinements by Urban Arts to scope and sequence, instructional supports, and cross-activity alignment, further strengthening Game On as a year-long AP CSP curriculum.

Study 4. 2023–2024 Study to Establish Promise and Readiness for Effectiveness Testing

Purpose and Design

WestEd’s August 2025 report presented findings from a full-year 2023–2024 study designed to assess whether Game On demonstrated early evidence of promise for supporting student learning in computer science, while continuing to examine implementation quality and feasibility. The study used a single-group design with 56 participating students (out of 84 enrolled across the five study classrooms) across five AP CSP classrooms and five teachers in four states—Michigan, Texas, North Carolina, and Florida. Thirty-two students completed both a pre-test and post-test.

Findings and Contribution to Game On’s Development

WestEd reported that students demonstrated overall computer science knowledge across the year, with modest item-level gains in core AP CSP domains such as loops and iteration on standardized content measures. Student attitudes and confidence showed little change from pre-test to post-test. Teachers reported high levels of student motivation, persistence, and investment, driven by hands-on game creation and inquiry-based learning. Teachers continued to report strong usability and alignment with AP CSP goals, while identifying areas for refinement related to pacing, differentiation, and assessment supports.

For the subset of students with available AP CSP exam data (n=25), students who participated in Game On earned an average score of 2.92—comparable to the national average of 2.9. This performance is notable given that 52% of participating students had IEP or special education status, and given documented achievement gaps for students from high-poverty schools, whose estimated mean scores typically range from 2.3 to 2.6. While based on a limited sample, these results provide initial evidence of promise that Game On may support students from traditionally underserved populations in accessing and succeeding in AP CSP coursework.

Study 5. Educator Readiness for Scale Survey (2026)

Purpose and Design

As Urban Arts prepares to expand Game On beyond the research phase and into broader implementation beginning in fall 2026, an educator survey was conducted in February 2026 to examine readiness for scale from the perspective of classroom teachers of Game On.² The survey was designed to understand teachers' implementation experiences, the usability of curriculum materials, the effectiveness of professional learning, pacing alignment across diverse schedules, and infrastructure feasibility in school environments.

30 current or former Game On teachers were invited to participate; 21 (70%) completed the survey. Respondents represented a wide range of computer science teaching experience, from novice instructors to advanced CS educators, as well as varied levels of prior familiarity with the Unity platform.

Key Findings

Overall findings indicated strong implementation experiences across classrooms. Teachers rated their overall implementation experience at an average of 4.33 out of 5. Open-ended responses indicated high levels of student engagement, with teachers noting that the Replicate–Modify–Create instructional progression worked even in classrooms where most students were first-time coders.

Professional learning emerged as a major strength of the program: summer training averaged 4.76 out of 5, and Unity-focused sessions averaged 4.62 out of 5. Teachers reported that the training and materials provided sufficient support for both novice and experienced computer science instructors. Curriculum materials were also rated highly for clarity and usability, averaging 4.38 out of 5, with teachers describing lesson slides, guides, and instructional resources as well organized and easy to implement. Pacing across different school schedules was viewed positively overall (average 4.19 out of 5), although teachers reported needing flexibility to accommodate variation in the time students require to complete coding projects.

The primary operational challenge identified in the survey was school technology infrastructure. Ease of installation and device readiness received the lowest rating (3.33 out of 5), reflecting barriers such as district firewalls, limited administrative permissions on student devices, and time required for software installation. Teachers emphasized, however, that once Unity was successfully installed and operational, classroom implementation proceeded smoothly.

Collectively, these findings suggest that Game On's curriculum model, professional learning system, and instructional materials are well positioned for broader adoption. Successful scaling will require continued guidance and technical support for schools navigating local IT environments.

²Research Study #5 was designed and conducted by Edward Metz, Ph.D. (WestEd conducted the remainder of research in this briefing).

Study 6. Current Impact Study by WestEd: 2025–2026

Building on initial evidence from usability testing, teacher experience, curriculum feasibility, and demonstration of promise, WestEd is conducting a quasi-experimental design (QED) study during the 2025–2026 school year in 23 schools. This study compares Game On to business-as-usual AP CSP instruction and is designed to generate evidence relevant to ESSA effectiveness standards. The study examines impacts on: (1) AP CSP exam performance; (2) computer science content knowledge measured by the Computer Science Concept Inventory; (3) student attitudes toward coding and growth mindset; and (4) changes in teachers’ instructional practices. Results from this study are anticipated in 2027.

Conclusion

The QED study represents the culmination of Urban Arts’ EIR project, informed by a coherent body of WestEd research that guided Game On’s progression from an early beta concept into a classroom-ready program demonstrated to be usable, feasible, and promising. Collectively, these studies illustrate a systematic approach to building evidence alongside product development, addressing a common gap between innovation and scale in computer science education.

Findings from the February 2026 teacher readiness for scale survey further indicate that teachers view the curriculum, professional learning system, and instructional materials as prepared for broader implementation, while also highlighting the importance of continued support for school technology infrastructure and additional automated just-in-time supports.

Game On is now positioned for rigorous evaluation of its potential to improve computer science learning outcomes and expand equitable access to engaging, high-quality AP CSP instruction through game design.

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