Abstract: This research explores the pedagogical potential of *Rabbids Coding*—a free, game-based learning platform developed by Ubisoft Montreal—as an innovative tool for introducing foundational programming concepts to students. The study investigates how integrating commercial educational games into classroom practice can enhance learners' computational thinking, problem-solving skills, and engagement with computer science. *Rabbids Coding* uses a drag-and-drop interface to teach sequential logic, loops, and conditionals through playful problem-solving tasks that require players to guide characters using algorithmic reasoning. Grounded in constructivist and experiential learning theories, this research examines the game's capacity to promote autonomy and iterative learning by allowing students to experiment, identify errors, and optimize their solutions in real time. Preliminary classroom applications indicate that such gamified approaches foster intrinsic motivation and make coding accessible to diverse learners, including those without prior programming experience. This research contributes to the growing discourse on game-based learning and underscores the role of commercial educational games in democratizing access to coding education.

Project Description Title: Rabbids Coding: Transforming Play into Pathways for Computational Thinking.

Project Overview

Rabbids Coding is a free educational video game developed by Ubisoft Montreal that introduces players to the logic and structure of computer programming through interactive play. Released as part of Ubisoft's broader commitment to accessible learning and digital inclusion, the game reimagines the chaotic humor of the Rabbids franchise as a structured, goal-driven environment for learning. It demonstrates how entertainment games can be transformed into effective platforms for developing essential 21st-century skills.

In the game, the Rabbids have invaded a spaceship and made a mess. Players are tasked with cleaning it up by issuing coded instructions to mind-controlled Rabbids using a simple drag-and-drop interface. Through this process, learners are introduced to the fundamental principles of programming—including sequential logic, loops, and conditional statements—without needing any prior coding experience. The challenge increases progressively, helping players develop confidence, persistence, and logical reasoning as they advance through more complex puzzles.

Educational Capabilities and Innovation

1. Accessible Introduction to Coding Concepts

Designed for players aged seven and up, *Rabbids Coding* lowers the entry barrier to computer science education. By removing the need for textual coding syntax, it focuses instead on the structure of logic and problem-solving. This makes it suitable for beginners, younger learners, and those who might otherwise find programming intimidating.

2. Learning Through Play

The game embodies the principles of game-based learning, combining humor, challenge, and storytelling to foster engagement and sustained motivation. Its incremental design allows players to learn from mistakes, test ideas, and refine their strategies—mirroring the real-world process of debugging and iterative problem-solving.

3. Self-Directed and Inclusive Learning

Rabbids Coding supports self-directed learning. Players progress at their own pace, gaining immediate feedback from the system as they test their code. The game's visual interface makes it accessible to a wide range of learners, regardless of reading ability or technical background, reinforcing inclusivity in digital education.

4. Encouraging Computational and Metacognitive Skills

Every puzzle requires players to think algorithmically: to plan, execute, observe, and adjust. This iterative process builds computational reasoning while also encouraging metacognitive awareness—an understanding of how one learns and solves problems. Players who revisit earlier challenges often seek simpler, more efficient solutions, naturally engaging with the idea of *code optimization* as a cognitive exercise.

5. Bridging Industry and Education

The project's development was led by Anthony Kozak at Ubisoft Montreal, whose background bridges programming, game design, and education. Ubisoft's initiative exemplifies how game developers can collaborate with educators to create tools that blend entertainment and learning, broadening global access to coding education.

Educational Significance

Rabbids Coding represents a meaningful step forward in making programming concepts approachable and enjoyable. It provides teachers and learners with a ready-made digital platform that complements formal computer science curricula and supports informal, self-guided exploration. By framing computational logic within a humorous and familiar narrative, the game turns abstract problem-solving into a tangible, playful experience.

Beyond classrooms, Rabbids Coding promotes equitable access to digital learning, being freely available worldwide on PC and mobile platforms. Its approachable design and multilingual availability embody a vision of learning that is open, inclusive, and rooted in creativity.

Conclusion

By blending education and entertainment, *Rabbids Coding* illustrates the power of video games as tools for learning and engagement. It shows that teaching logic and programming does not require complex syntax or textbooks—it can emerge naturally through play, experimentation, and curiosity. As an educational innovation, the game stands as a model for how commercial developers and educators can collaborate to foster digital literacy and inspire the next generation of thinkers and creators.

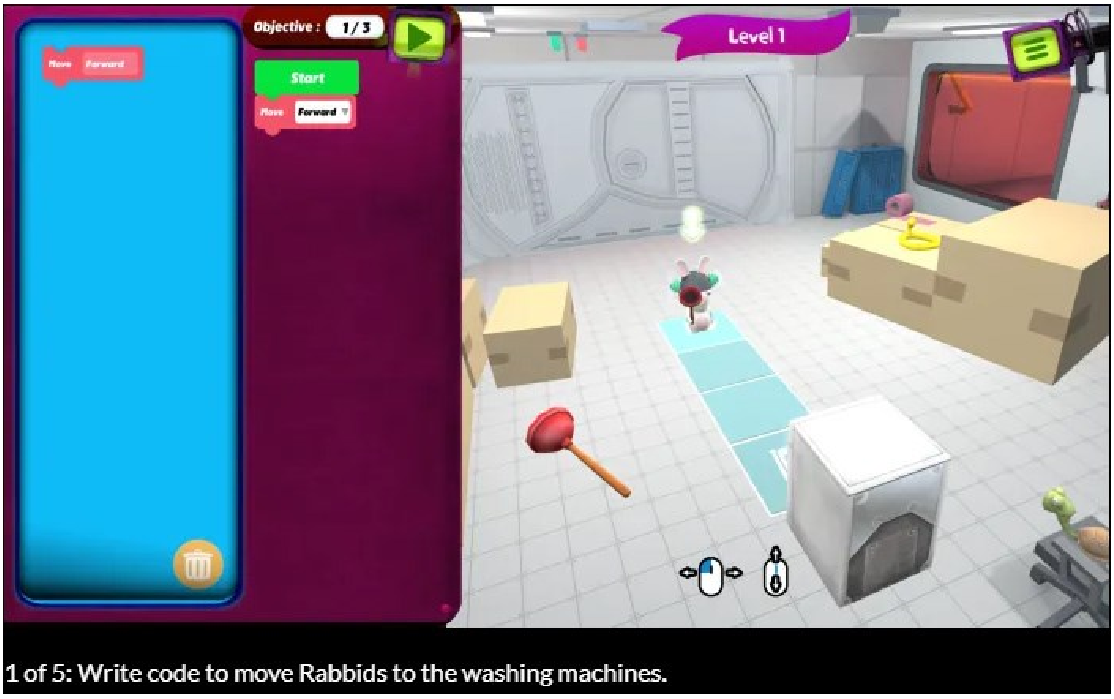

Figure 1. Screenshot 1

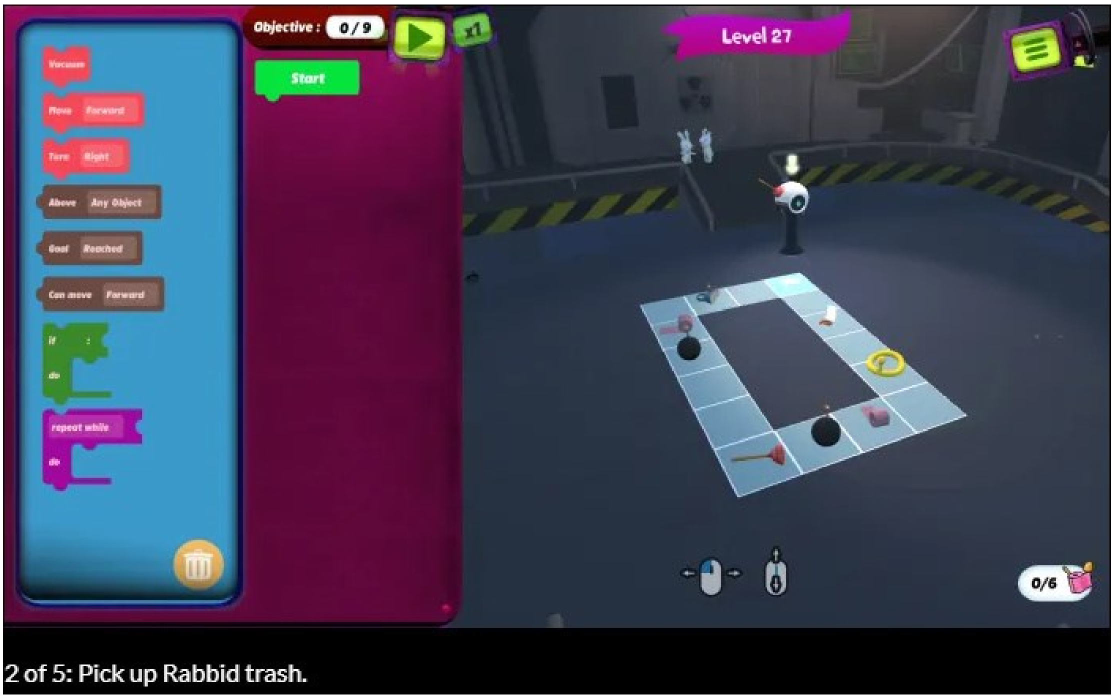

Figure 2. Screenshot 2

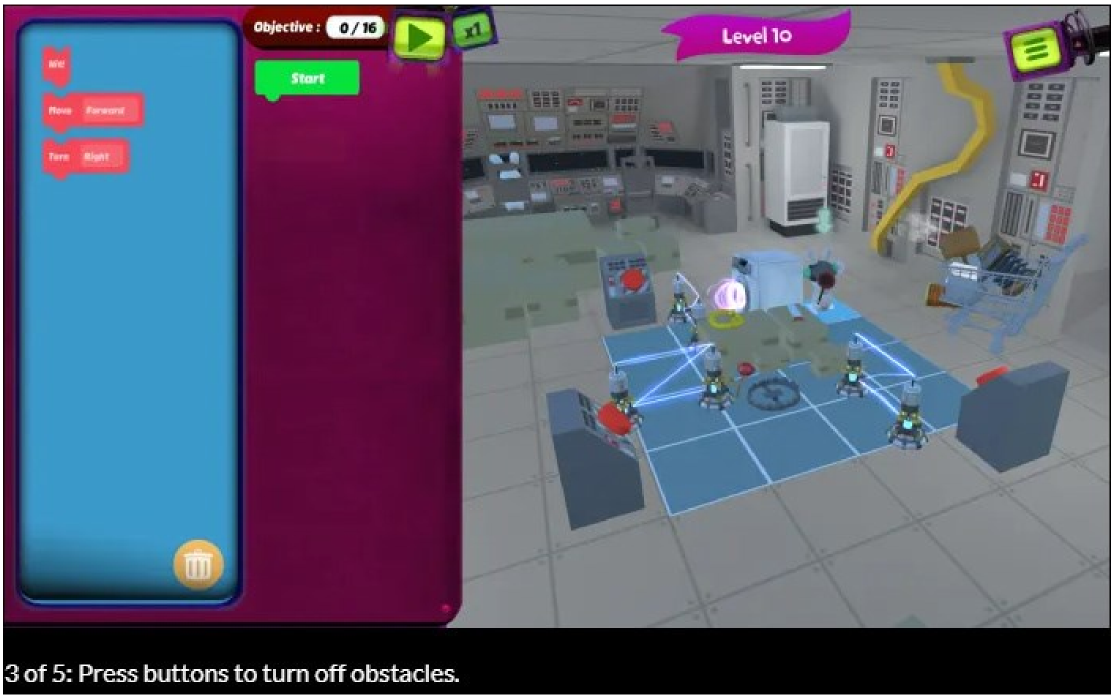

Figure 3. Screenshot 3

Figure 4. Screenshot 4

Figure 5. Screenshot 5

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Innovation of the Project

Project Title: Rabbids Coding: Transforming Play into Pathways for Computational Thinking.

1. Introduction to the Innovation

Rabbids Coding represents a pioneering example of how entertainment-driven design can be transformed into a powerful educational instrument. Developed by Ubisoft Montreal, the game introduces programming fundamentals through intuitive play, turning abstract computational logic into concrete, interactive experiences. Its innovative strength lies in combining commercial-grade game design with pedagogically informed learning outcomes, effectively bridging two domains that are often seen as distinct: digital entertainment and formal education.

Rather than presenting coding as a technical or intimidating discipline, Rabbids Coding makes programming accessible to learners of all ages through humor, storytelling, and experimentation. This approach positions the game as both a gateway to digital literacy and a model for learning innovation in the 21st century classroom.

2. Core Innovative Features

a. Game-Based Learning Through Commercial Design

Unlike traditional educational software, *Rabbids Coding* was built with the same professional quality, polish, and engagement strategies as Ubisoft's commercial titles. The use of the iconic Rabbids franchise transforms what might otherwise be abstract problem-solving tasks into fun, narrative-driven challenges. This commercial-grade entertainment design elevates engagement and retention, showcasing how the gaming industry can contribute meaningfully to education.

b. Intuitive Visual Programming Environment

The game replaces conventional syntax-based coding with a drag-and-drop interface that mirrors block-based languages such as Scratch, but situates them in a dynamic, story-rich context. This lowers cognitive barriers to entry and enables learners—particularly children aged seven and above—to focus on core logical structures: sequencing, loops, and conditionals.

c. Learning Through Iteration and Play

At the heart of the game's innovation is its iterative feedback loop. Players test their commands, observe the outcome, and refine their code—engaging naturally with the trial-and-error process central to computational thinking. Failure becomes a learning mechanism, not a penalty, reinforcing resilience and problem-solving persistence.

d. Inclusive, Accessible, and Autonomous Learning

Rabbids Coding supports self-directed learning in both formal and informal contexts. Its interface transcends linguistic and literacy barriers, allowing diverse learners to succeed without extensive teacher mediation. This inclusivity advances digital equity and aligns with global educational goals for accessible technology.

e. Industry-Education Collaboration

The project was conceptualized by Anthony Kozak at Ubisoft Montreal, whose dual expertise in education and programming informed the game's progression design. This partnership between game developers and educators exemplifies how the private sector can co-create learning tools that combine entertainment appeal with pedagogical depth.

3. Educational and Technological Impact

Rabbids Coding redefines how early coding education can be delivered by:

- Promoting computational thinking as an engaging, exploratory process rather than a rote exercise.
- Enhancing digital literacy and logical reasoning across age groups.
- Providing an entry point for STEAM education through playful experimentation.
- Offering teachers a ready-to-use, cost-free digital tool adaptable to various curricula.

Its innovative design demonstrates that complex concepts such as algorithms, conditions, and optimization can be internalized through interactive storytelling—showing that games are not mere diversions but pedagogical ecosystems capable of teaching core cognitive skills.

4. Distinction from Existing Educational Games

While many educational games teach coding through simplified mechanics, *Rabbids Coding* distinguishes itself through:

- Professional-grade design quality, equal to mainstream entertainment games.
- Narrative coherence, leveraging familiar characters to sustain emotional engagement.
- Iterative learning structure, seamlessly integrating testing, feedback, and reflection.
- Scalability and openness, being freely available worldwide across platforms.

These attributes collectively establish the game as a benchmark for serious games that balance fun and instruction without compromising either.

5. Broader Innovation and Legacy

Beyond coding education, *Rabbids Coding* exemplifies a broader innovation in how society views games as tools for learning, inclusion, and civic engagement. It challenges the misconception that play and education are opposites, demonstrating instead that structured play can drive deep conceptual understanding. Its success has inspired new discussions in academia and industry around gamified learning, digital citizenship, and STEAM outreach.

By merging commercial creativity with educational vision, *Rabbids Coding* offers a replicable model for future collaborations between technology developers, educators, and policymakers seeking to democratize access to digital skills.

6. Conclusion

The innovation of *Rabbids Coding* lies not merely in teaching coding, but in transforming the act of play into a cognitive and creative pathway toward computational literacy. It proves that when learning is engaging, interactive, and inclusive, it can reach audiences far beyond traditional classrooms. As both a digital product and a pedagogical concept, *Rabbids Coding* stands at the frontier of educational innovation—demonstrating how entertainment technology can become a powerful agent of learning and empowerment.

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Description of How This Project Can Be Implemented in Day-to-Day Life

Rabbids Coding: Transforming Play into Pathways for Computational Thinking can be implemented effectively in everyday life because it merges play, accessibility, and learning in a way that fits naturally into both formal and informal settings. As a free, visually intuitive educational game, it allows learners to engage with coding concepts at their own pace, transforming ordinary digital play into a meaningful opportunity for developing logical reasoning, creativity, and problem-solving skills. Its simple interface, humorous design, and progressive difficulty make it suitable for children, families, and even adults who wish to build computational literacy in a relaxed, enjoyable manner.

In the classroom, *Rabbids Coding* can serve as an entry point for introducing the fundamentals of programming and computational thinking. Teachers can use short gameplay sessions to illustrate the concepts of sequencing, loops, and conditional logic, reinforcing lessons in mathematics, science, and digital literacy. Because the game provides immediate feedback, students can test hypotheses, identify errors, and revise their strategies—mirroring the process of debugging used by real programmers. This interactive learning process promotes persistence, critical thinking, and metacognition. Educators can integrate the game into daily classroom activities, after-school clubs, or project-based learning environments, using it to spark curiosity and collaboration among students.

Beyond formal education, *Rabbids Coding* is also highly adaptable for use at home. Parents and children can play together, turning screen time into shared learning experiences that promote conversation and creativity. Families can incorporate the game into everyday routines, using short challenges as a fun cognitive exercise. Because the game requires no prior knowledge of coding and offers clear visual cues, learners of different ages can enjoy it independently. The process of issuing commands to the Rabbids helps players understand how instructions translate into digital actions, reinforcing digital awareness and responsible technology use in daily life.

In community settings, *Rabbids Coding* can be implemented in libraries, youth centers, and informal learning spaces as a gateway to digital literacy and STEM engagement. Community programs or coding clubs can use it as an inclusive tool to introduce participants to algorithmic thinking before moving to more advanced coding platforms. Public workshops can use the game to promote creativity, collaboration, and access to technology among diverse populations. Its multilingual availability and minimal hardware requirements make it particularly valuable in communities with limited educational resources, helping bridge the digital divide and making learning through play universally accessible.

Even in adult learning and workplace contexts, *Rabbids Coding* has practical applications. Organizations can use it in professional development workshops to strengthen problem-solving, systems thinking, and innovation. For educators, it can serve as a demonstration of how gamification enhances engagement and comprehension. In all contexts, the game fosters transferable cognitive skills such as logical reasoning, adaptability, and iterative thinking—skills increasingly essential in both personal and professional life.

Ultimately, the daily implementation of *Rabbids Coding* promotes a mindset of experimentation, reflection, and growth. By encouraging users to test, fail, and refine their solutions, the game instills perseverance and confidence—qualities valuable in all aspects of learning and living. Whether used in a classroom, at home, or in a community space, *Rabbids Coding* turns everyday interaction with technology into a source of curiosity, discovery, and empowerment. It seamlessly integrates education into day-to-day life, demonstrating how play can become a powerful medium for cultivating computational thinking and lifelong learning.