



Riverdale High School Teaching Computer Science Without Prior Experience



Holly Ades
Technology Teacher
Fort Myers, FL

Implementation

Grades Taught 10-12

Length of Use 1 year

Students Enrolled 26
this Year

Courses Covered

- CompSci 1
- GameDev 1
- CompSci 2
- WebDev1

Success Highlight

"I have a mixed variety of students with various learning levels. All of my students, regardless of their learning abilities, have enjoyed this program."

Riverdale High School in Fort Myers, Florida is just 160 miles west of Miami, where you find forest-lined rivers and wetland preserves a few miles away from some of the most innovative companies in the world.

A few years ago, Riverdale was faced with the exciting challenge of rolling out new state computer science policies that require a computer science class in every high school. The 2,167 students at Riverdale High would finally have access to computer science-- they just needed someone to teach it. Holly Ades answered the call. "They kind of asked who wanted to do it and I volunteered. Even though I don't have a whole lot of experience in it." As Ades explains, she chose to teach computer science because the excitement of her students was palpable: "A lot of the IB [International Baccalaureate] kids are the ones that wanted the AP computer science course and they all came to me and asked if there's any engineering or any robotics [classes]."

For Holly Ades, teaching runs in the family. "My dad's a teacher so he kind of talked me into it," she explains with a quiet confidence that's a credit to her eight years of experience teaching. Despite her years of experience, teaching computer science and coding was as new to her

as it was to Riverdale High School. So, Ades decided to take a chance for her students because, she explains, "I'd rather the kids have it" than face the possibility of another year without a computer science class. Ades' goal was to find a program that would allow her high-achieving students to excel at learning to code and keep them engaged, while also supporting her through teaching a new subject and surpassing the goals her administration set for the class.

Challenges



Ades is not alone in confronting the challenge of being a computer science teacher without coding experience. In a study done in partnership with McRel International, CodeCombat found that over 1/3 of teachers had no prior experience with coding (n=123).¹ Being asked to teach something you have never learned is a monumental undertaking, but despite her own apprehension, Ades did it because “all the kids wanted it really bad” and “no one else wanted to do it.” Through her own optimism and drive she wanted to try

anything possible. “I don't know anything about coding, but it's what my husband does. He's a software engineer. So, I'm like, I'll just learn. I'll figure it out.”

Unfortunately, for Ades, her husband only worked with MUMPS,² “which has nothing to do with Python or JavaScript,” Ades said. “So he couldn't really teach me either.”

The start of Ades' journey, to teach her students to excel at coding while learning the language herself, was not easy. A class full of high achieving students made the task more nerve-wracking. Ades started to become frustrated while testing out resources on her own, stating, “I was actually crying at one point because I was so nervous about doing this and I had no idea what I was doing.”

Implementation

“ My training instructor during the summer guided me towards CodeCombat and said it was the best purchase he made for his students. I originally was planning on purchasing the paid version of another program, but was told by multiple instructors that this program would benefit my students the most. ”

Holly Ades, Technology Teacher

¹ <https://drive.google.com/open?id=1fKbJFHxk-EAvXwIGrn6MReMyaeQW8EA5>

² <https://en.wikipedia.org/wiki/MUMPS>

Riverdale principal, Scott Cook, knew that “computer engineering is a growing industry” and that they wanted “to provide [...] students with the advantage of having the knowledge and experience to put them ahead of other candidates.” To support the students, Cook knew that he had to start by ensuring that the school and district supported Ades. They started by finding assistance from the district CTE department and other teachers that had helped implement computer science at their schools. The district also provided Ades with AP professional development training at the AP Summer Institute³ last summer to help her discover the best methods to present the course.

Ades went to the AP Summer Institute fully ready to purchase another program, but her AP instructor told her, “No, get CodeCombat. If you’re going to spend the money go purchase that.” In fact, other instructors she spoke with had used CodeCombat with their class and also recommended it as being the most beneficial for her students.

When Ades tried CodeCombat with her high-achieving students, she found it was a perfect balance of student engagement and academic rigor. With CodeCombat being a College Board endorsed provider of curriculum and professional development for AP Computer Science Principles, Ades knew she had found her solution:

“I tried 7 different programs that relate to AP CS Principles. CodeCombat is the only program that is designed to assist fully with the coding aspect [of Computer Science]. Many of the other programs are designed to correlate with college platforms, but the students struggle to engage with these programs. CodeCombat keeps the students engaged with a fun platform.”



28 Current Students

Students at Rivedale High School have written:

1,548

computer programs

136,379

lines of code

59

games and web projects

Concepts Learned

Basic Syntax	Place game objects
Arguments	Construct mazes
Strings	Basic CSS
While Loops	Basic Input Handling
Variables	Basic Game AI
Algorithms	Basic Web Scripting
If Statements	Advanced HTML
Functions	Basic JavaScript
Parameters	Basic Event Handling

³ <https://apcentral.collegeboard.org/professional-development/workshops-summer-institutes/about-summer-institutes>

Successfully Engaging High-Achieving Students

I have reviewed and tried many different programs. CodeCombat is the best solution for instructing students on how to code. It is a challenging program that is fun and engaging for the students. My students love when I assign a Code Combat level.

Holly Ades, Technology Teacher

Ades teaches a mix of IB and non-IB students in grades 10 through 12 in her AP CSP class and has structured her class around the 4 C's of 21st century skills. Ades starts her class with communication through group instruction, teaching students the levels and "big ideas" prior to them starting their assignments on CodeCombat. After the lesson, she transitions into critical thinking through self-paced learning, giving students guidance when needed, but ensuring "they attempt the level on their own before asking for assistance." She will then supplement self-paced learning with times that she pairs students into groups of three. So far almost all the students are on target working this way. "They actually all work together and that's one thing I push because in the real world they all have to collaborate [when] coding," Ades said, "So they get to pretty much sit down and work together but they're learning and they're trying." Finally, Ades encourages creativity by assigning a monthly level and a final project as a goal they must accomplish. Currently students are working their way through Web Development 2, which is an impressive pace considering they started CodeCombat in the third week of school.⁴



Through this system, Ades feels much more at ease with teaching coding than she was last year: "I'm a lot more comfortable. I feel like there's a lot of things that kids know better than I do but I try and figure it out." Ades is so comfortable she's even helping her husband, "Actually I've been teaching him through this," Ades says. "[He] and my brother-in-law. [They] work for the same company [and] both been using this to learn." Ades' husband has tested all her programs to help give her insight and she said he ranked this as his top

⁴ <http://files.codecombat.com/docs/resources/HighSchoolPacing.pdf>

choice. Ades has even had her husband come in and talk to her students about how much he has to collaborate as a software engineer.

Ades credits many of the teacher forward features as tools that empowered her, "When first learning about the program I didn't realize that we could view the live view of what each student is writing for their code and then compare that to the solution," Ades said. "This has helped me tremendously with assisting the students. As an instructor with little to no experience in coding, this guide has surprised me and helped me teach the course to my highest ability."

Ades had the opportunity to welcome incoming freshmen to open house by letting them play CodeCombat saying, "I set this up on a laptop and just kind of let kids play on my account. They were loving it. I had a whole bunch of incoming freshmen they were like, 'This is awesome!' They were all playing it." Helping incoming students become excited about computer science goes a long way in alleviating some of the pressure of teaching students with no coding skills.

Feedback from Principal Cook has also been positive, "Overall, the students have enjoyed the course... and we hope it has left them with the knowledge they will need as they enter college or the workforce."

Ades talks about one student who has found success and is motivated through CodeCombat:

"One of my students is already almost done with the next level so she'll only have four levels left to do. Mind you, it's a girl that knew nothing about coding and she was so nervous about taking this class. [Now] she's the one that is the farthest ahead."

Preparing Students for Real World Success

Principal Scott Cook also recognized the importance of exposing Riverdale students to coding through his own research. "Teaching coding provides students with the experience to develop strategies to create solutions," Principal Cook said. "The statistics show that computer engineering is a growing industry and we want to provide our students with the advantage of having the knowledge and experience to put them ahead of other candidates."

While the administration is waiting for AP scores this summer for insight on how well the students do on the exam, everyone has noticed that the students are highly engaged in learning a skill they can genuinely use in the future. Principal Cook said:

CodeCombat has provided a platform that is engaging and beneficial for the students. They have developing coding skills in both Javascript and Python they will be able to use for future job opportunities.

Scott Cook, Riverdale High School Principal

The students who advocated for AP CSP at Riverdale know what they gain from CodeCombat is worth the cost. "Listen, we're spending money on this," Ades said. She asked the students, "Is it worth it? Do you guys think that we should keep going? There's not one person that said no we shouldn't use this."

Ades held a career fair where students had the opportunity to talk to career professionals and learn how computer science will correlate with actual careers they want to pursue. "Even if you decide you don't want to go in some sort of computer science career it's going to help regardless because everything is going that way. I think they all realize that too," Ades says.

No matter what career they decide, Ades was able to overcome her own nervousness about teaching coding and has given her students a head start by giving them the opportunity to learn real skills they can use in advanced classes or future jobs.

CodeCombat helps them progress towards the career choices they may select in the future. Multiple students have come to me saying they want to gain knowledge in web development or game development, because that is the field they plan to enter after college. This program gives them specific guidance in the field they plan to follow.

Holly Ades, Technology Teacher



Tips for Teachers

Ades recommends that teachers trust their own instincts when it comes to pacing out what they assign. Next year instead of going into some of the harder more advanced Computer Science courses, she plans on starting a new course so her students have the chance to learn both Python **and** JavaScript.

“The next year I might split it in half. So the first semester work all in Python. The second semester work all in [JavaScript]. I'm saying, pick a language and determine what you want to do and pace it out accordingly.”