

# How to Effectively Deliver Engaging Online Courses



**codio**

Bring your vision of CS Education to life

# PRESENTERS



**GWEN BRITTON, Ph.D.**

Dr. Gwen Britton has served as the Academic Associate Vice President of STEM and Business Programs at SNHU's Global Campus for the past six years.

In her current role, she is passionate about expanding and growing STEM opportunities and access for individuals who otherwise would not have an opportunity to pursue a career in STEM areas.



**ELISE DEITRICK, Ph.D.**

Elise is Codio's Vice President of Product & Partnerships. Elise has spent the last decade teaching STEM to a wide variety of age groups. Her research interests are in collaborative computing and equity in computer science.



# Designing Online Courses for Scalability and Reusability

The screenshot displays the Coderunner web interface. On the left is a code editor with the following Python code:

```
import sys
num = int(sys.argv[1])
answer = num * 5
print(answer)
```

On the right is the test runner panel, titled "1. Standard Code Test". It contains the following text:

**Standard Code Test**  
Write a program that takes an integer as a command line argument. Multiply this number by 5 and print this result.

Below the text is a "TEST YOUR CODE" button. Further down is a "Check Your Code" section with a "Submit your code when ready" button. Below that, it says "Here is one possible solution:" and shows a code block with the same Python code as in the editor. Below the code block, it explains: "To accept command line arguments, you need to import the `sys` library. `sys.argv` is a list that of arguments passed to the program. The first argument is always the name of the program. So the number passed to the program will be the second element in the list, which is `sys.argv[1]`. These arguments are always passed as a string, so be sure to typecast it as an integer. Print the integer multiplied by 5."

At the bottom of the test runner panel, there is a "Check all" button and a summary of test results:

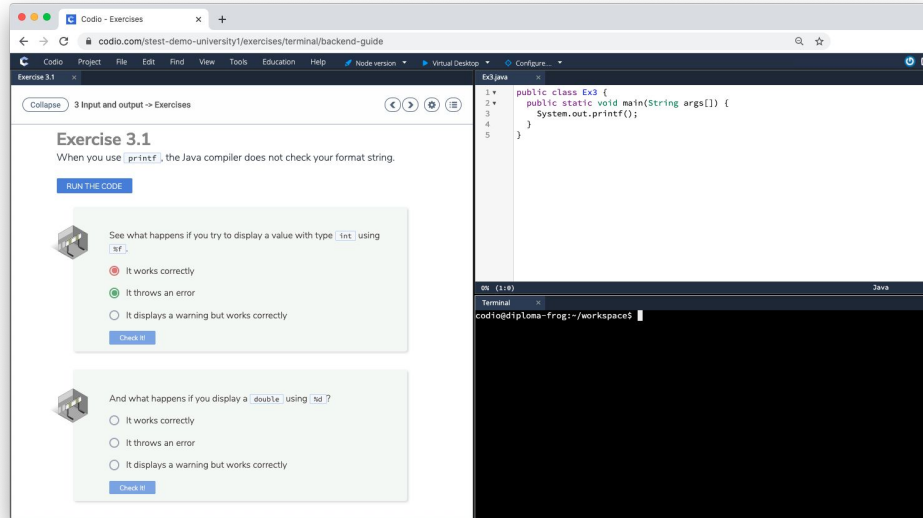
LAST RUN on 1/26/2020, 3:13:46 PM  
✓  
Check 1 passed  
Check 2 passed  
Check 3 passed

Publish your curriculum content to courses, which can be adapted and reused semester-to-semester.

Create anything from simple assignments and and assessments to fully-fledged curriculum resources with built-in assessment libraries.



# Level-Setting the Student Experience



Codio provides a consistently high-quality learning experience, regardless of a student's setup.

All a student needs is a web browser and an internet connection.



# Ensuring Engaging & Achievable Experiences for Students Working Remotely and Asynchronously

The screenshot displays a Coderunner interface. On the left, a code editor window titled 'diy.py' contains two lines of code: `1 # Write your challenge code below` and `2`. Below the editor is a Python interpreter window showing '0% (1:0)' and a URL 'https://sleep-taxi-9500.codio.io/diy'. The main area features a game preview window titled 'sleep-taxi-9500' showing a top-down view of a game with a player, monsters, and an energy store. The game status is 'steps: 1', 'energy: 10', and 'score: 0'. To the right, a task instruction panel titled '3. 1. Doing it all yourself' provides a list of seven steps for completing the code. The steps include setting initial score and energy, setting sounds, handling monster collisions, hitting the energy store, subtracting energy per turn, displaying a message at the exit, and calculating the score using the formula  $score = \frac{energy \times 6}{steps}$ . A 'Check It!' button is at the bottom of the panel.

3. 1. Doing it all yourself

Complete the code on the left so

1. When the games starts, set the initial score to 25 and the player energy to 20.
2. Set the sounds (bump, energy, fight and goal-reached) for each corresponding event. As a reminder, the available sounds are `bump`, `energy`, `fight` and `goal-reached`.
3. When a monster touches you, you should subtract 3 from the energy.
4. When you hit the energy store, you should add 5 to your energy.
5. Each time you take a turn, you subtract 1 from your energy.
6. When the exit has been reached, you should display a message using the `showMessage()` function.
7. You calculate and display the score using the formula

$$score = \frac{energy \times 6}{steps}$$

Check It!

Successful online learning programs require a student experience proven to boost engagement

Higher student satisfaction and engagement result in better learning outcomes—meaning lower attrition and greater course completion rates.

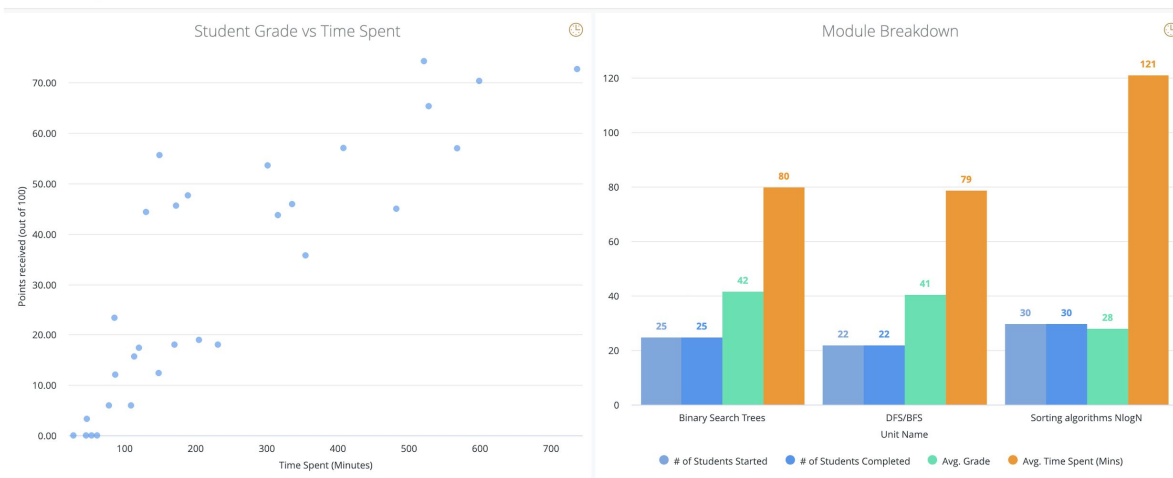


# Measuring the Effectiveness of Course Content

## Module Insights

Module Insights

Each Tile's Time Zone  
1m ago · UTC



Learning Insights provides actionable visualizations of student performance at multiple levels, enabling instructors to identify students who need more help or need to be challenged.



# Tools for Instructors Looking to Build Their First Online Courses

Refresh code

Execution type: Python3.x

Python 3.6

1 numbers = [1, 2, 3, 4]  
→ 2 for number in numbers:  
→ 3 print(number)

→ line that has just executed  
→ next line to execute

<< First

< Back

Step 8 of 10

Forward >

Last >>

Python Tutor by Philip Guo.

Print output (drag lower right corner to resize)

1  
2  
3

Frames

Objects

Global frame

numbers  
number

list

0 1 2 3  
1 2 3 4

With Code Visualizer, built on Philip Guo's wonderful Python Tutor work, students can write and edit code in the IDE, and with a click of a button see what's happening under the hood.



## Leveraging Communities of Educators to Inform Courses

```
code/HelloW... x HelloWorld.java
File: code/HelloWorld.java
1 public class HelloWorld {
2     public static void main(String args[]) {
3
4         //add code below this line
5
6         System.out.println("Hello, world!");
7
8         //add code above this line
9     }
10 }
```

Jun 15th 2020 1:03pm (UTC -04:00) America/New\_York  
Modified by: stest-university-of-c...

Speed 5 cps

Code Playback enables teachers to get a glimpse into their students' thought processes by taking snapshots of their code creation from beginning to end.



## Using Online Resources in the Classroom

**Variable Swap**

Construct a program that swaps the values of variables `x` and `y` using the helper variable `tmp`. You can change the names of the variables `??` by clicking them.

Drag from here

?? = ??

?? = ??

?? = ??

Construct your solution here

Check It!

Next ▶

Instant student feedback gives students an immediate, rich explanation of their work.

Students will get a sense of their understanding of the material immediately after they are introduced to it and as they attempt more difficult problems.

# Thank you!

To get started with Codio, visit  
[www.codio.com/getstarted](https://www.codio.com/getstarted)



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