Affordable Learning Georgia Textbook Transformation Grants

Final Report for Mini-Grants

General Information

Date: **November 22, 2019**

Grant Round: **12**

Grant Number: **M50**

Institution Name(s): **Columbus State University**

Team Members (Name, Title, Department, Institutions if different, and email address for each): **Hyrum Carroll and Hillary Fleenor, TSYS School of Computer Science**

Project Lead: **Hyrum Carroll**

Course Name(s) and Course Numbers: **CPSC 1301K**

Final Semester of Project: **Fall 2019**

If applicable to your project:

Average Number of Students Per Course Section: **30**

Number of Course Sections Affected by Implementation of Revised Resources: **12**

Total Number of Students Affected by Implementation of Revised Resources: **~360**

1. Project Narrative

Describe the course of your revision or ancillary creation project, including

- *A summary of your project's purpose, plan, and timeline.*
- *The original works which were revised or added to, with links.*
    - *For example, if you revised an open textbook, give the title, author, and link.*
- *A narrative description of how the project's plan was carried out.*
- *Lessons learned, including anything you would do differently next time.*

We (the PI and Co-PI) decided to moving all sections of CPSC 1301 - Computer Science 1 (now CPSC 1301K) away from an eTexbook ($77) to using a free textbook (https://runestone.academy/runestone/books/published/thinkcspy/index.html). The eTextbook included practice problems which significantly aid in learning computer science. This grant facilitated the change to a free textbook by supporting the creation of a repository of 92 practice problems by students. Almost all of these problems were created during the Spring 2019 semester. A few more problems were created during the Fall 2019 semester (to

address gaps in coverage of topics). Surveys were sent out to students at the end of Spring, Summer and Fall 2019 semesters. Overall, the project was a success!

Some things we learned and would do differently next time is better recruitment of the students for the surveys. We were surprised at how few students filled out the surveys.

2. Materials Description

- *Describe all the materials you have created or revised as part of this project. These descriptions may be used in the GALILEO Open Learning Materials repository in the official description field.*

We created the following Python practice assignments in repl.it. Each of these practice assignments have either output checking or unit checking (starting with Functions*). For many of these assignments, there are multiple tests. All of these assignments have been saved in a single file and uploaded with the final report.

Intro01 Go Cougars
Intro02 Quotes
Intro03 CSU Fight Song
Intro04 Assigning a Variable
Intro05 Number of Classes
Intro06 1958 int
Intro07 1958 str
Intro08 Pi Approximation
Intro09 Friends and Pizza Slices
Intro10 Pizza for Fido
Intro11 Hello
Intro12 Years as Columbus College
Intro13 Lowest to Highest Precedence
Intro14 Making Change

Modules01 Dice Simulator
Modules02 Square Garden
Modules03 Random Number
Modules04 Mathematical Constant e
Modules05 Pi
Modules06 Pizza Area

Functions01 Cups to ounces
Functions02 Ounces to cups
Functions03 Reverse name
Functions04 Calculate interest
Functions05 Property Tax
Functions06 Paint Job
Functions07 Stadium Seating
Functions08 Calories From Fat
Functions09 Calories From Carbs
Functions10 Division Function
Functions11 Sweets Order part 1
Functions12 Sweets Order part 2
Functions13 Hypotenuse part 1
Functions14 Hypotenuse part 2
Functions15 Taxi Fare part 1
Functions16 Taxi Fare part 2
Functions17 Turtle Mural part 1
Functions18 Turtle Mural part 2
Functions19 CSU Taco Shop

Selection01 isOdd
Selection02 Division and Remainders
Selection03 Biggest Number
Selection04 Smallest Number
Selection05 Middle Number
Selection06 Letter Grade
Selection07 Zip Zap Zop
Selection08 Speeding Ticket

Loops01 Sum of Natural Numbers
Loops02 Product of Natural Numbers
Loops03 Number Series
Loops04 Number Series with commas
Loops05 Number series while
Loops06 Compound Interest
Loops07 Inches to Feet
Loops08 Odd and Even
Loops09 isPrime
Loops10 Prime Numbers
Loops11 Calculator

Strings01 Iterating Over a String
Strings02 Reverse the String
Strings03 Uppercase Letters
Strings04 Changing Hills
Strings05 Password
Strings06 Scrambled
Strings07 Manipulating Strings
Strings08 Split and Swap
Strings09 Palindromes
Strings10 Letter Grade

Lists01 Names
Lists02 Powers of 5
Lists03 Odd and Even
Lists04 Modify a list
Lists05 Reverse Sort
Lists06 Min- Max- Sum and Count
Lists07 Party Invitation
Lists08 Extra Credit Total
Lists09 Shift Grades
Lists10 Longest Word
Lists11 isScrambled

Files01 Read an Entire Text File
Files02 Read File Contents and Remove End Returns
Files03 Read the 3rd Line of a File
Files04 Append Text to a File
Files05 Reading and Storing
Files06 Counting Lines
Files07 Write a List content to a file
Files08 Random Line
Files09 Search in a file
Files10 Compare files

Dict01 Login Validation
Dict02 Character Frequency
Dict03 What is the Most Common Name

3. Materials Links

- *If you are hosting your materials in places other than GALILEO Open Learning Materials, please provide these links in this section. Otherwise, leave blank.*

The practice assignments are also available in our repl.it "classroom".

4. Future Plans

- *Describe any planned or actual papers, presentations, publications, or other professional activities that you expect to produce that reflect your work on this project.*
- *Describe any plans to revise or add to these materials in the future.*

In March 2020, we will be presenting our poster entitled, "Creating an OER Collection of Automatically Scored Practice Exercises for Computer Science 1" at the ACM's (Association for Computing Machinery) Special Interest Group on Computer Science Education (SIGCSE) 2020 conference. Additionally, using repl.it for this project has sparked the idea to perform further research about autograders, including a usability study of the most common autograder systems.

Finally, our students have recognized the value of these practice assignments and have been asked for analogous practice assignments in later courses. We plan on continuing to use this repository of practice assignments.