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Engaging Assignments Increase Performance

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UNLV Best Teaching Practices Expo 2019

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The practice and the need it addresses

Motivating Students to Complete Assignments

It is well known that students who complete homework assignments and other outside of class activities related to the course lead to improve student outcomes. However, engaging a student and motivating them to complete their assignments is no easy feat.

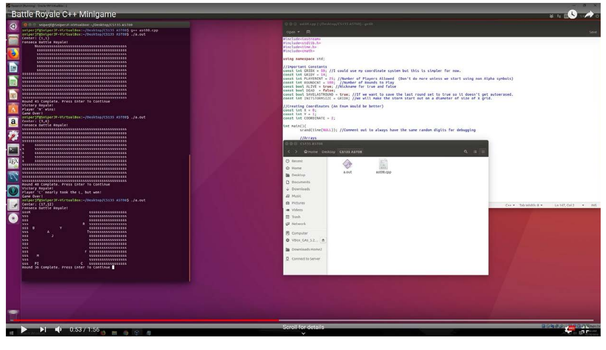
Approach

To address this, we developed new assignments for two sections of the Fall 2018 course CS135. This course focuses on teaching computer programming in C++ and is key for higher level computer science courses. The weekly assignments focus on writing C++ code that applies material covered on the lecture the prior week. Normally these assignments are simple and as mechanical as possible to enable the student to practice the coding without additional difficulties. This also makes them uninteresting. For these two sections instead we developed a series of assignments involving the same skill sets but with pop culture themes like Star Wars and Battle Royale video games. We either created a role-play around the programming assignments, such as creating a record of fictional ships, or had them code interactive programs since many of the students have interest in the video game culture scene.

Evidence this practice benefits UNLV Students

Results and Benefits

For the assignments given involving engaging material (some assignments were done in the old format in order to have a control group). Many students reported a sense of accomplishment and pride after completing their creations/programs (data source was ongoing comments by the students in addition to an anonymous survey given to the students at the end of the semester). Students asked more questions and showed more interest in acquiring knowledge they may not have understood in class initially as it was necessary for them to complete the assignments. This increase in engagement and motivation resulted in a higher percentage of student submitting the assignment and a higher amount completing the assignment correctly even after 80% of the students reported these assignments to be of higher difficulty than other assignments that were not using the themes. Students were surveyed after the assignment deadlines & at the end of the semester.



One of the new Assignments involved creating/coding a video game that mimics a very popular genre in video games (Fortnite Battle Royale).

Resources and where to find them

Resources

•Articles:

- Science Teaching Reconsidered: A Handbook (1997) Chapter 8: https://www.nap.edu/read/5287/chapter/9
- Keller, John M. "Strategies for stimulating the motivation to learn." Performance+ Instruction 26.8 (1987): 1-7.

•Example Assignments along with Videos showing the functioning programs. The videos allow the students to see what they will achieve when done:

- Battle Royale C++ Minigame https://www.youtube.com/watch?v=X2DZD4KaBUA
- Interactive 8 Puzzle C++ Game https://www.youtube.com/watch?v=qFZ1RLNhQ5E

Explaining one of the Assignments. One can see the great interest and attention given by the students as they look forward to their next assignment.

How other UNLV teachers might adopt this practice

Extensibility

This practice is not limited to programming in Computer Science. Applying knowledge to “real-life problems” or doing a form of role-play for most fields is possible. Whether it be in mathematics where instead of solving a differential equation one can solve a population growth and decay problem that uses the same differential equation, but set in a fictional world from the latest blockbuster movie, or in organic chemistry assignment where the assignment is wrapped in a role-play situation that the student can relate to, most fields can develop assignments that practice the same material, but still engage more due to the added level of interest. The only additional resources required is an understanding of what interest the students. A simple survey to the students is all that is needed to learn this. In our case we surveyed the class in the beginning of the semester for pop culture topics that they would be interested creating programs for. This data was then used to develop the assignments. This does add a due hardship of creating the assignments in the middle of the semester. However, for a long term implementation of this, surveys can be done and then that data can be used for the following semester and so on. Like anything else, listening to the student is key.

Potential Challenges

Engagement must not be done at the cost of an increased difficulty in an assignment. While a level of abstraction will be added to the assignment, careful balance to ensure the assignment is still clear is key. Furthermore, constant updating of assignments to relevant and meaningful material is important, but comes at the cost of the additional time required to develop and maintain assignments that are motivating, original, and relevant.

Closing remarks

While students should always strive to do everything they can to succeed. Creating engaging assignments helps them enjoy their assignments more & therefore perform better because of the increased motivation.