

# EECS 582 Final Project Design

## Team 12

**Members:** Katie Lucas, Jordan Love, Megan Rajagopal, Joey Pennington, Haleigh Hunt

**Name:** Dragon's Adventure

**Synopsis:** We are creating an entertaining and educational children's point and click adventure game using the Universal Design for Learning (UDL) guidelines.

**Description:** This project is being undertaken because we have found a lack in quality, fun, and educational games for children that address the need for UI changes in games for younger users that may not be accustomed to using technology such as a computer or a mouse. For example, many children's games on the market do not have identifiable stories or characters, and this game intends to create an entertaining and subtly educational game for this audience using the Universal Design for Learning guidelines. It will also serve to be a gentle entry into video games and technology for children where the game is not too frustrating or difficult to navigate. Additionally, the few games which do exist cost money or are blocked behind ads and multiple in-game purchases which ours will not have. The game will also be voice acted so the game is more accessible to younger audiences who are still learning to read, and puzzles will not be language specific. The end result of this project will be a complete game that has been user tested and improved upon through research. We are taking a UX/human-centered design approach with lots of user testing alongside development.

## Semester 1 Milestones

- Research UDL guidelines 10/9/2020
- Project Storyline written 10/16/2020
- Project Dialog written 11/13/2020
- Begin coding over winter break 1/2/2021

## Semester 2 Milestones

- Finish Programming First Draft of Game 2/28/2021
- Conduct User Test 3/15/2021
- Edit Game Based on Feedback 3/21/2021
- Finish Game Completely 4/12/2021

## Budget

Description	Vendor	Date Required	Special Training	Estimated Cost
Spring Semester Research Compensation	KU	March 2021	N/A	\$200
Possible Recording Equipment Rental Fee	KU	March 2021	N/A	\$30
iOS Developer Membership	Apple	March 2021	N/A	\$99
			Grand Total	\$326

## Final Project Design

Dragon's Adventure will be a point-and-click adventure game that is primarily aimed at younger children between the ages of three and six. During our research, we found that there was an extreme lack of easily accessible children's games on the App Store from both a technological and financial point of view. In general, our game will be a gentle entry into both video games and technology with simple games and an interactive storyline.

The software will be an application on the App Store with the intent that it will be played on an iPad. The basic organization of the game is that there is a map that allows the player to pick which area the user wants to travel to, an introduction tutorial that teaches the player how



Click on areas on the map to enter new locations! Use the arrow button to go back or the x button to close the game.

to navigate the game, and three different areas for the player to enter and leave whenever they wish. The game will follow a baby dragon that has fallen out of the nest. The dragon must navigate the kingdom in order to find all the map pieces to get back home before sunset. The picture to the left is a primitive example of what the map will look like in the game. As previously mentioned, there will be three map areas. The main

areas include the kingdom's castle, a magical forest, and a mermaid lagoon. Within the lagoon

and kingdom area there will be two locations and the forest will have one. Each of these sublocations will have one mini game. Some examples of mini-games we are including in the design are dress-up, rock paper scissors, a memory game, and I spy. After all mini games in each main area have been successfully completed, the player will receive a map piece to help the baby dragon get home.

An example of what each of these areas will look like is pictured below from a children's game we have taken inspiration from, Putt-Putt Enters the Race. After unlocking the map piece, the player is then free to return to this area or continue to other areas to progress the story.

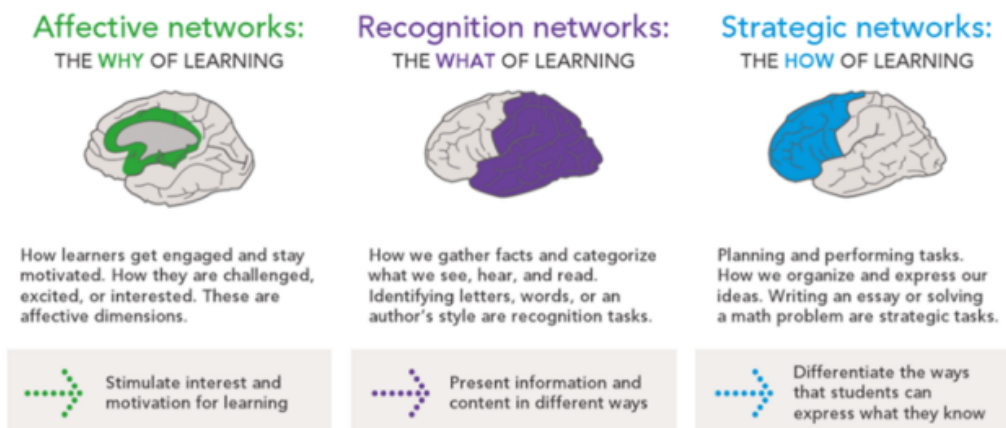
Once all the three map pieces are collected, the player will win the game and the dragon can find their way home by clicking on the then completed map. The software will work by having on click events for when something is clicked. Some aspects of the game will be plot relevant. For instance, clicking a



certain character will trigger a dialog to begin a mini game. On the other hand, other aspects will trigger various interactive animations, such as popcorn popping when it is clicked. When something is clicked, we will either code a dialog to begin or for that object to move. We will code everything in the game using Unity and C#. There will also be an arcade area where the player can play any mini game they want anytime. Playing mini games in the arcade area will not progress the game forward.

Another important aspect of our project design is utilizing the Universal Design for Learning (UDL) guidelines. These guidelines provide an optimal teaching and learning model for all people that is based on the science of how humans learn. UDL is based on three main pillars: engagement, representation, and action and expression. In general, our goal for the project will be to ensure that all children will be able to fully engage with the game regardless of any mental or physical disability. We decided to adopt this framework because each team member is interested in learning more about user experience and a human-centered design approach. A summary of each pillar is described in the image below.

## Universal Design for Learning



As stated above, we will use Unity and C# to design our project as well as incorporating university-wide collaboration. We believe that this is the best option because Unity has many built-in features and resources to help us easily implement our ideas. Moreover, a few members on the team have experience with game design on Unity. Most importantly, Unity will allow us to easily export our game as an application for either the App Store or a simple online game. A unique aspect of our game is that it will include cross collaboration with the School of Music and the School of Architecture & Design. In order to make the game as interactive and engaging as possible, we are going to include custom soundtracks, animations, and artwork. We will work with Caitlin Crosby, a senior composition student in the School of Music, to create a soundtrack for each map area and various sound effects. We will also collaborate with a special art class that has been created to work with the capstones Dr. Gibbons is overseeing to get our art and animations.

Our main constraints will be in the form of the budget, the technology used to implement the game, and the overall timeline. As explained by Dr. Johnson, we are not allowed to commission any art or music for our game. Consequently, we are limited to working with Caitlin and the class for creating all the art, animations, and music. However, we could also commission art or music from people willing to help for free or locate free to use art and music online. Another constraint is testing since some of us do not have iPads. In general, a majority of children play mobile games on their parents' iPads. While we would still want to optimize the game for iPads, we will be limited by only being able to test the game on Joeys' iPad. This means that only one person would be able to test the game at a time. Another constraint will be our schedule. We have much to accomplish in a relatively short amount of time if we want to be completely finished by the spring semester. It is imperative for us to stay on schedule in order for us to conduct multiple user tests and implement the feedback like we hope. Another constraint is that some of us do not have much experience with or knowledge of Unity. It will take some time for everyone to figure out how to use it, but luckily, there are many resources for us to quickly understand the basics of the new platform. The last constraint is to ensure that we will carefully follow the UDL guidelines. This would include understanding any future implications that our initial design may have later in the project. For example, we need to take things such as color blindness and multiple ways of communicating the information into consideration while creating our game.

In summary, Dragon's Adventure will be an entertaining and educational children's point-and-click adventure game. The game, developed using Unity and C#, will follow a baby dragons' journey across a magical kingdom as they find their way back home. The game will be developed using Unity and C# while also implementing the UDL guidelines to ensure that all children will be able to fully engage with the game.

## Ethical Issues

- 1) One ethical issue that might arise is that when we are doing research, we must be careful that we are doing it the proper way and asking appropriate questions. Working with younger children means that we need to be extra careful with data privacy because they are minors. We will make sure to have Dr. Gibbons involved with all of our research, and we will plan everything out carefully so that no issues arise while gaining feedback from younger user testers. Additionally, we will create user testing protocols if we conduct any formal, live user tests so that guardians and the children themselves fully understand what is asked of them.
- 2) Another ethical issue is attribution of credit. We will make sure to credit everyone who works on the game in any way in the credits so that any use of art, graphics, or music is attributed and everyone is properly recognized according to ACM rules of ethics. This would include crediting the creators of the music and art as well as any free-to-use music or art we find online. By crediting the appropriate people, we will prevent any possible plagiarism or copyright issues, as well as highlighting those whose work significantly impacts the success of the game and who deserve to be acknowledged.

## Intellectual Property Issues

- 1) Related to the second ethical issue, one intellectual property issue is that everything we include in the game with art or music must be fair to use in our game. Additionally, in the case we decide to charge for the app on the app store, the art and music must be fair to use in a game that is for-profit and not just for personal projects. We will also have to look to see if they desire credit in the game or what their requirements for using their work are, if any. Further, we will want to protect the game after its completion from unauthorized use, potentially through licensing (even if open-source).

## Change Log

Description of What Was Changed	Reason
The budget no longer includes possible art or music commission.	We removed this because we are prohibited from paying for art or music, and we have the means of procuring this for free.
The budget no longer includes prototyping software.	We planned the game on paper and began creating it so we would have more time for programming.