

Biology Learning Games and Animation

CSCE 606 Software Engineering

Iteration 0

Team roles:

Product Owner: Prajwal Das

Scrum Master: FNU Nimisha

Developers: Shubham Gupta, Sai Harini Voruganti, Apurva Purushotama

Customer meeting date/time/place: Minutes of meeting: Customer Meeting-1

We had a meeting over Zoom with Dr. Walker on February 25th, 2022 3 pm - 4 pm to discuss the customer requirements for the project. The meeting minutes are attached . Meetings will continue weekly Fridays at 3pm - 4pm CST.

Important Links:

GitHub repo: <https://github.com/prajwaldas95/BiologyLearningGamesAndAnimations>

Pivotal Tracker: <https://www.pivotaltracker.com/n/projects/2556976>

Slack:

https://join.slack.com/t/seoproject-1oc6126/shared_invite/zt-141c9mqw1-YZvyPf_VxICrw8ThiZ63Vg

VetMed Website: <https://vetmed.tamu.edu/peer/one-health/>

SpreadSheet(Deployment Status):

https://docs.google.com/spreadsheets/d/10NGrOZEGldePJ_KSnpPO_ENLpEQdU_VA3r1yopvTpGY/edit#gid=0

Inventory Sheet: SpreadSheet:

https://docs.google.com/spreadsheets/d/10NGrOZEGldePJ_KSnpPO_ENLpEQdU_VA3r1yopvTpGY/edit#gid=0

Summary:

The customer for this project is Nicola Ritter from VetMed (Veterinary Medical & Biomedical Sciences department at Texas A&M University). The main customer need is to develop and integrate interactive animations into the Stepstone learning environment and WordPress-based web site to improve the biology learning experience of middle school students. StepStone is an application authoring system provided by the Texas A&M Center for Educational Technologies. It is designed to work over HTML5 for desktop and mobile platforms. The motivation behind developing animations for learning is to design the curriculum to be more engaging and motivating for the students. Interactive animations are an effective learning tool to keep the young students motivated to learn new and complex things quicker, and to keep them engaged in the material and will provide the students with an entertaining visual approach to learning and remembering the material.

There is a framework already built for this project. Our primary goal for the project is to identify all the developed animations across all modules and deploy them into the StepStone learning environment if not done already and also deploy them in the WordPress-based web site. Next, we focus on working on the animations (based on customer provided requirements) which are still not developed, polishing the content based on the prior framework, and to parameterize the animations using json files so that these animations can be easily and effectively used in multiple modules. Finally, we develop some new animations, learning games and little quizzes to test student knowledge.

User stories:

1. **Feature:** Inventory check and mapping of the new animations

As an Instructor

I want to make an inventory of such animations

So that I can know the list of the animations are yet to be developed

2. **Feature:** Inventory check and mapping of the existing animations

As an Instructor

I want to make an inventory of such animations

So that I can know the list of the animations are not working or yet to be deployed

3. **Feature:** Fix the Eukaryotic Plant Cell review, Cell Biology module animation

As an Instructor

I want to fix the Eukaryotic Plant Cell review animation in the Cell Biology module

So that the students can have a smooth user experience

4. Feature: Fix the Eukaryotic Animal Cell review, Cell Biology module animation

As an Instructor

I want to fix the Eukaryotic Animal Cell review animation in the Cell Biology module

So that the students can have a smooth user experience

5. Feature: Fix the Can you master the Cell's mastermind, Cell Biology module animation

As an Instructor

I want to fix the Can you master the Cell's mastermind animation in the Cell Biology module

So that the students can have a smooth user experience

6. Feature: Fix the This or That CS1, Cell Biology module animation

As an Instructor

I want to fix the This or That CS1 animation in the Cell Biology module

So that the students can have a smooth user experience

7. Feature: Develop animations for Zoonotic diseases classification-bacteria module

As an Instructor

I want the students to use interactive animations by drag-drop feature to categorize living organisms

So that the students can understand the concepts better.

8. Feature: Develop animations for Zoonotic diseases-Classification Eukarya module

As an Instructor

I want the students to use interactive animations by filling the blanks

So that the students can understand the concepts better.

9. Feature: Fix user interface of Keep it in Balance

As a user

I want to see the submit button

So that I can check my answers.

10. Feature: Implement restart game in the Label the Neuron

As a player,

I want to restart the game with the click of a button at any instant as needed

So that I can recheck my learnings.

11. Feature: Improve the Clinical Trials module, Scientific Methods section (3 Slides)

As an Instructor

I want to improve the green pop up display to include the correct answers in the green pop up with a small explanation.

So that I can know the explanation for the correct answers selected

12. Feature: Improve the Clinical Trials module, Clinical Trials explained section (2 Slides)

As an Instructor

I want to improve the green pop up display to include the correct answers in the green pop up with a small explanation.

So that I can know the explanation for the correct answers selected

13. Feature: Add animation to Clinical Trials module, Phases of Clinical Trials section (1 Slides)

As an Instructor

I want an animation to drag and drop the details into placeholders for phases

So that students can organize the details of clinical trials into phases

14. Feature: Add animation to Clinical Trials module, Cost of Clinical Trials section (1 Slides)

As an Instructor

I want an animation to drag and drop statements into the cost placeholder

So that students can identify the phases that add to cost of clinical trials

15. Feature: Improve the Genetics module, Sexual Reproduction section (2 Slides)

As an Instructor

I want to enhance the user experience by changing the animation to drag and drop instead of having drop-downs.

So that students can answer the classification question better

16. Feature: Improve the Genetics module, Variation in traits section (1 Slides)

As an Instructor

I want to enhance the user experience by changing the animation to drag and drop instead of having drop-downs.

So that students can answer the classification question better

17. Feature: Improve the Genetics module, DNA and Alleles section (1 Slides)

As an Instructor

I want to enhance the user experience by changing the animation to drag and drop instead of having drop-downs.

So that students can answer the classification question better

18. Feature: Improve the Genetics module, Predicting traits section (1 Slides)

As an Instructor

I want to enhance the user experience by changing the animation to drag and drop instead of having drop-downs.

So that students can answer the classification question better

19. Feature: Parametrize the animations

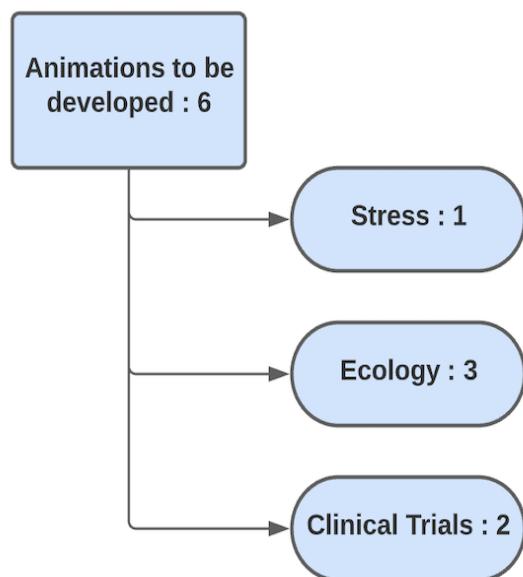
As an Instructor

I want to parameterize the animations

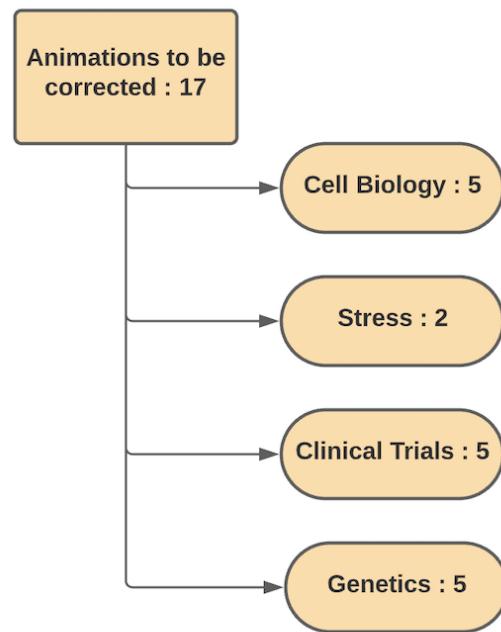
So that I can reuse the code over and over again in multiple modules

User Interfaces

Feature 1: Inventory check and mapping of the new animations



Feature 2: Inventory check and mapping of the existing animations



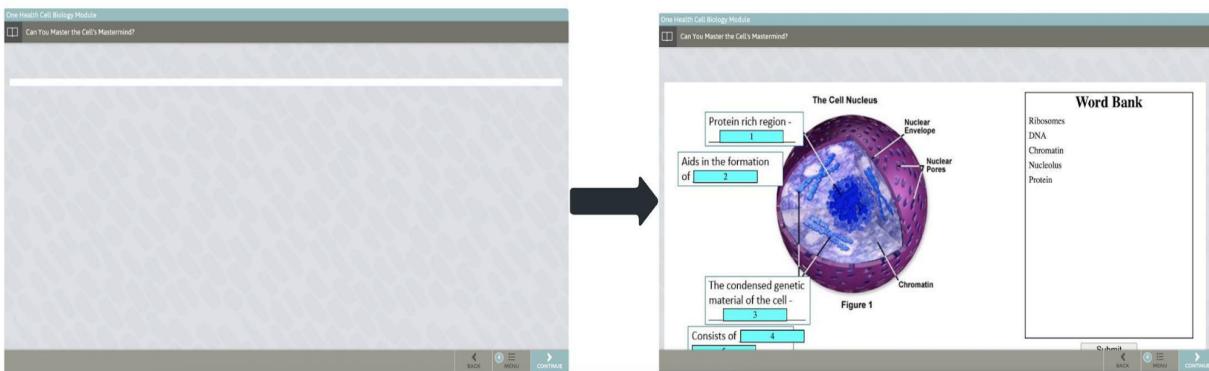
Feature 3: Fix the Eukaryotic Plant Cell review, Cell Biology module animation



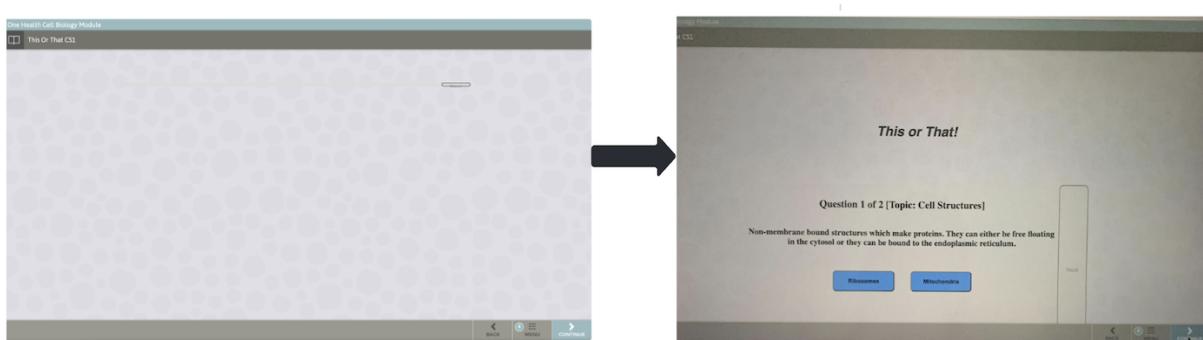
Feature 4 : Fix the Eukaryotic Animal Cell review, Cell Biology module animation



Feature 5 : Fix the Can you master the Cell's mastermind, Cell Biology module animation



Feature 6 : Fix the This or That CS1, Cell Biology module animation



Feature 7 : Develop animations for Zoonotic diseases classification-bacteria module

Scientists also classify living organisms



How could you classify these animals?

Drag and drop into groups

Puppies

Kittens

Feature 8 : Develop animations for Zoonotic diseases-Classification Eukarya module

There are ___ domains and ___ kingdoms in the current classification scheme.

However, classification systems may change as new organisms are discovered and we gain more information about known living organisms.

Enter response for Blank 1 first, then Blank 2.

Blank 1



Scientific ideas may change with new evidence.

Blank 2

Feature 9: Fix user interface of Keep it in Balance

Please place the correct answers in the blank below questions

What is the term which means maintaining a constant internal environment despite changes in the external environment?

Answer:

Which two body systems help regulate the internal environment?

Answer:

Balance
Muscular system
Homeostasis
Endocrine system
Stimulus
Nervous system
Reflex arc
Cardiovascular system

Submit

Submit Button
should be visible →

Feature 10: Implement restart game in the Label the Neuron

Label the Neuron

Cell Body
#3

Axon
#5

Dendrite
#4

Takes information from other neurons
#6

to

Electrical and chemical information moves across this space

RESTART

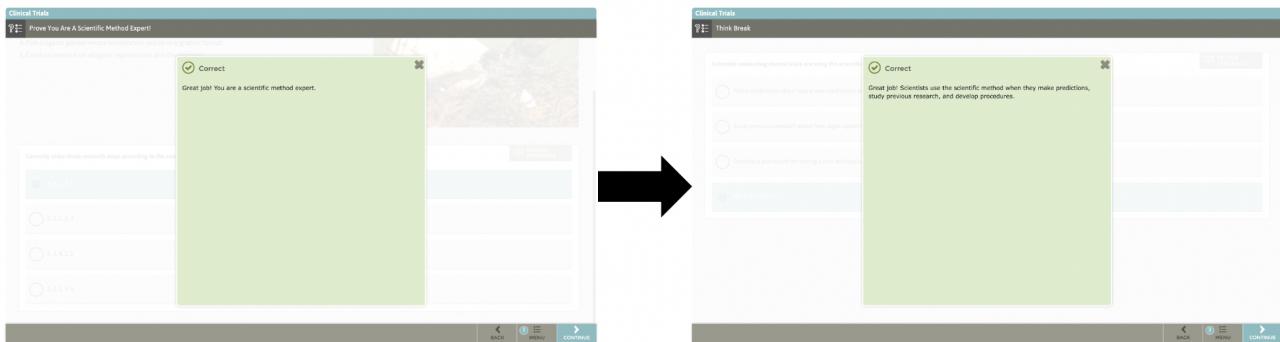
Addition of Restart Button

Synapse nucleus away

Submit

You answered 2/8 questions correctly!

Feature 11,12: Improve the Clinical Trials module pop-up display (3+ 2 slides)



Feature 13: Add animation to Clinical Trials module, Phases of Clinical Trials section (1 Slides)

Clinical Trials

Organize the Details of Clinical Trial Phases

Drag and drop the descriptions into the appropriate phase. Some descriptions may be used multiple times.

Phase I	Phase II	Phase III	Phase IV
			<ul style="list-style-type: none">• Safety• Fewer than 100 people• Long-term study• Comparison to similar treatments• At least 100 people• Side effects• Several hundred people or more• Large groups of people• Effectiveness

BACK MENU CONTINUE

Feature 14: Add animation to Clinical Trials module, Cost of Clinical Trials section (1 Slides)

Clinical Trials

Can You Count The Costs?

Drag and drop the word or statement that adds to the cost (financial and time) of clinical trials.

The Costs of Clinical Trials	
<ul style="list-style-type: none">• Research• Patients/subjects• Education• Data analysis• Facilities• Insurance• Vacations• Veterinarians• Vehicles• Travel• Physical processes	

BACK MENU CONTINUE

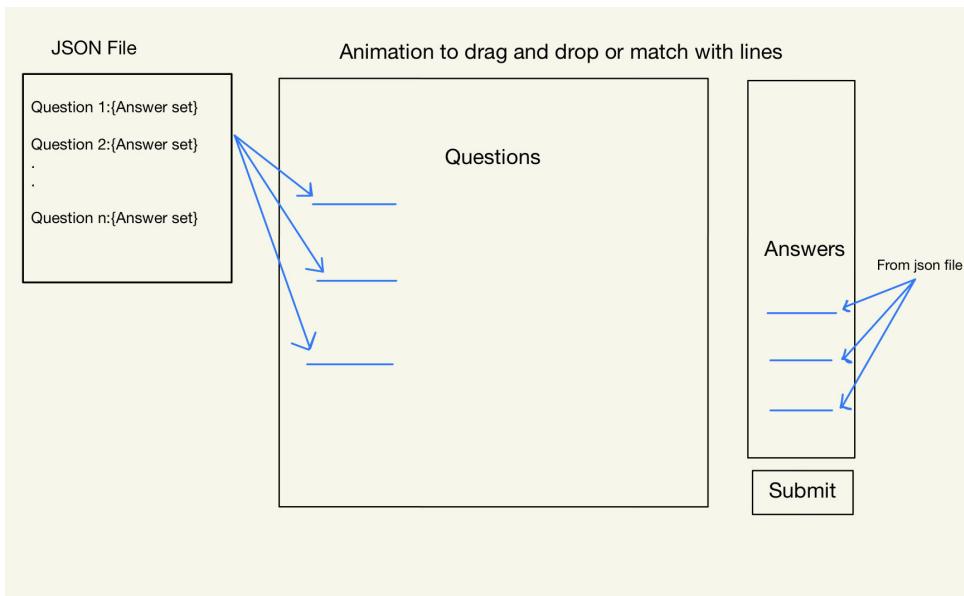
Feature 15, 16, 17, 18: Improve the Genetics module, Sexual Reproduction section (2 Slides)

The interface consists of three main sections:

- Top Section:** A table with two columns: "Asexual Reproduction" and "Sexual Reproduction". To the right is a list of terms: Meiosis, Diploid, Diverse, 2 cells formed, Haploid, Identical, Mitosis, and 4 cells formed.
- Middle Section:** A table with two columns: "Asexual Reproduction" and "Sexual Reproduction". The term "4 cells formed" is listed under the Sexual Reproduction column.
- Bottom Section:** A table with two columns: "Asexual Reproduction" and "Sexual Reproduction". The terms "Meiosis" and "Diverse" are now correctly placed in the respective columns.

A large downward arrow between the middle and bottom sections is labeled "More user-friendly".

19. Feature: Parametrize the animations



Strategy for legacy code improvement:

- Deploy animations which currently have placeholders
- Parameterize the existing animations so that they can be easily modified
- Making animations mobile devices compatible.
- Improvement of the previous animations

Grading approach:

Since most of the time, the developed applications are deployed into the StepStone environment in the final iterations, some of the user stories may not be completed until the last iteration. Therefore, the earlier iterations cannot be judged on the number of points completed in the iteration. The qualitative approach should be employed to compare the iterations i.e., the amount of progress made in the applications in each iteration.