Specification Document

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Table of Contents

Part A)

Part B)

1. Statement of Instructional Problem and Proposed Solution:

Many people in modern society, particularly younger people, do not possess basic nutrition skills such as the ability to choose healthy foods to eat or how much of the food that they do choose, to eat. One skill that many people do not have is that of being able to read and fully understand nutritional facts found on most food labels. For instance, many people can look at a food label and see a certain fact about that food, such as calorie amount and grams of fat per serving, yet overlook other vital facts such as the amount of sodium or fiber in a serving.

Additionally, many people do not know the immediate benefits of eating healthy over that of unhealthy foods and the potential benefits or lack there of, of their food choices. For example, eating a candy bar instead of a piece of fruit may give a person instant energy, but that energy will last a short time and run out extremely fast. Eating fruit instead will not provide as instant energy as a candy bar, but will instead provide a steady source of energy that will last much longer.

According to a report by the Centers for Disease Control and Prevention entitled "Guidelines for School Health Programs to Promote Lifelong Healthy Eating", the authors state that, "Healthy eating patterns in childhood and adolescence promote optimal childhood health, growth, and intellectual development; prevent immediate health problems, such as iron deficiency anemia, obesity, eating disorders, and dental caries; and may prevent long-term health problems, such as coronary heart disease, cancer, and stroke." (CDCP). Here we see that eating correctly is critical to good health in younger people and has potential for many other positive aspects as well. Additionally, the article states that, "The primary goal of nutrition education should be to help young persons adopt eating behaviors that will promote health and reduce risk for disease. Knowing how and why to eat healthily is important, but knowledge alone does not enable young persons to adopt healthy eating behaviors [...]" (CDCP). Here again we see the importance of nutrition education and how simply knowing the concepts is, while important, not enough.

A solution to this problem is to design an interactive digital environment where someone would be able to see the importance of nutrition and food label reading in an accelerated and meaningful way. This virtual world is to incorporate the ideas and concepts of nutrition in such a way as to intrigue the player and immerse them into a learning situation without having the important content being lost, as well as not losing the player to only potentially boring facts and concepts.

The CDCP states in the same article several assumptions about the benefits of computer based learning of nutrition that it, "[C]an also be effective [...] especially when teacher time is limited or when student self assessment is appropriate." and that, "Computer-based lessons allow students to move at their own pace and can capture their attention."(CDCP).

By providing an environment in which a player will be able to control a character and see the immediate results of their food choices reflected in the gameplay, the player will be able to

understand the basic importance of wise food choices. In the virtual learning environment, the character the player will control will be that of a person or being stuck in an "End of the World" scenario where the food choices they make will ultimately result in the character either surviving or perishing. This level of virtual "stakes" will compel the player to make their character survive, and in the process of doing so, learn the importance of nutrition.

2. Rationale for a Virtual World:

A virtual world will allow a person to accomplish and learn ideas and concepts in, potentially, a very short time. By using a virtual learning approach, the player will be able to be the one in control of their education and will set the pace of their learning. This contained and individualized learning environment will allow learning, that would otherwise be very hard to achieve by traditional means, outside of the classroom and for a fraction of the cost.

To increase the potential of learning, the teaching concepts are provided in a manner that is entertaining to the user. Making the virtual world entertaining helps to keep the user mentally involved. It also helps to keep the user coming back at a later time to play the game again and further explore the virtual world. The idea is to keep the user interested long enough to the point where they have fully understood the material that is being taught.

3. Target Audience and Instructional Setting:

The target audience is for anyone ages 10 years and older who wants or needs to learn important concepts regarding nutrition and healthy eating. The setting in which the software is to be used is that of the classroom or in a private setting on an individual or group computer and, possibly, devices. These people will need to understand how to read, but not necessarily write. The user should also understand basic math concepts as nutrition labels are presented using percents and daily values.

The virtual world will be made available online as well as a downloadable exe file. The virtual world may be used in a variety of instructional settings. These settings will in some way be related to nutritional labels, but whether the virtual world is used in a classroom, home environment, road trip, etc. is yet to be seen. It will most likely be used in a classroom or home setting though. The user will always access the virtual world through a computer via online or offline.

4. Learning Objectives Sample Assessment :

1. Reading and understanding food labels and nutrition facts
2. Choosing healthy foods over unhealthy ones.

3. Wise planning and basic resource management.

Fiber, protein, and calcium are few examples of nutrition facts that the user should know after exploring the virtual world. Each of these facts as well as possibly others will directly impact the player's movement speeds, accuracy and health. Other aspects of the game may be impacted, but have yet to be decided at this time.

The user will have to understand the food labels to keep their character alive and in good health throughout the game. The choices that the player make in game will directly impact their character so if he or she does not understand food labels it will impact the performance of their character negatively and ultimately may result in the player dying.

5. Description of Treatment:

The virtual world is meant to provide factual information regarding food labels, but the genre of the game falls under the adventure category. The view will be 3rd person and 1st person with the option to toggle between the two views. Some elements of the virtual world are better viewed in 3rd person, while other elements of the virtual world are better viewed in 1st person so the toggle option provides the user with the ability to decide when each view is appropriate.

The user can play as long as they survive. The length of time that they survive is directly impacted by how they utilize the food labels and avoid getting hit by zombies. If the user is moving slow he or she will likely begin to think that his or her character needs more protein. This is what the user should be thinking and it also serves as a way to show that the user is understanding the concepts that are being provided.

Some jokes will be put in the game to keep it entertaining, but the jokes will not be too dark. The overall feel of the game should also be that of a hunter gatherer in some ways. The user will hunt zombies to move on the next round, but the user also needs to gather supplies to survive and will only have limited space for their inventory.

6.Content Outline:
Intro
1. Main Menu
   a. Game title
   b. Creator logo(s)
   c. Copyright and Trademark info
   d. Start button
   e. Load Button
   f. Help Button
   g. Credits button
   h. Level Select button

2. Character selection
   a. Choose a character
   b. Continue button

3. Story Outline
   a. Story premise
   b. Continue button

4. Game controls tutorial
   a. Basic interaction course
   b. Introduction to inventory system
   c. introduction to combat system
   d. Continue button

5. Level select
   a. Choose level
   b. Back button

Main Game Environment

1. Freeroam learning environment
   a. Interactive 3D level
   b. Survival tactics dependent on interaction
   c. Inventory
   d. Limited resource managment
   e. Pause menu
      i. Resume button
      ii. Load Button
      iii. Quit Button
      iv. Save Button
      v. Help Button

Statistics Screen

1. Player game statistics
2. Level completion statistics

7.Program Flow:

Logging In:

When the user first opens up our program a title screen will welcome them and tell them the name of the game and instruct them on how to get started. When the user presses the appropriate button to start the game they will be asked if they want to log in or continue as a guest. If they choose to log in as a guest all the scores and character customizations will not be saved for them. If they choose to log in they can either register or use their credentials to log in and play as the character they made the previous time. Users who register for the first time or users who choose to play as a guest can choose a male or female character and choose some customizations on how they look (skin color and some clothing choices) this should help them feel more connected with their avatar. After choosing their character they will go to the level select page.

Level Selection:

If they have beaten any levels there will be more than the first tutorial level available if not that will be the only choice. Regardless of which levels they have available there will be a short voice intro to the level explaining the purpose of the level. When the user selects a level a screen will show up telling the user more information about the level. This could include a map and potential areas of danger or places to find food. After they choose a level it will load and we will display a helpful tip while it loads.

Tutorial Level:

The tutorial level will be different from a normal level for a couple of reasons. First it will display much more information on how to control a character. We will prompt the user to go through all the movement controls and item controls. Secondly there will be an in game guide that will help the user find their way to a food store and help them pick out good food and give them some tips on what is better or worse and why. For example they will recommend water over soda. In the "real" levels the user will have to make these decisions for themselves. The instructor will also teach the player on how to fight a zombie.

Levels:

Levels will be mostly "open world" but will be limited to the current city. There will be zombies in the city and some food supplies. The user will start the level in a relatively safe place so they may take some time to come up with a plan and not worry about being attacked right as they start. The information they were told (hints and maps) will be available in the players notebook. Users can die from poor nutrition, dehydration or zombie attack. Users can attract zombies by being seen by them or being heard by them. Users will lose "nutrition" points

by simply existing and lose more by moving or attacking. To maintain nutrition level they have to find food. Finding food that is more nutritional will give them more points than food that is bad. Each level is timed and to win users will have to fuel their bodies for that period.

Level Failure:

      Users who fail to survive a level will be shown a screen that will try to help them understand how they died. They will be given the option to retry the level or go back to level select.

Level Success:

      Users who survive a "level" period be told how well they survived. If they had great nutrition they can get bonuses for the next round or level up. If they just survived they won't get these bonuses, and will be given hints on how to improve their nutrition seeking skills These bonuses will hopefully make it worth their time to play levels a couple times and learn more about nutrition. After selecting bonuses, users can go to the next level or back to level select.

8. Proposed Timeline:

Task	Hours	End Date
Generate Ideas	4	on going through project completion
Proposal due	2	2-16-14
Design Specs due	3	3-5-14
Project Alpha due	40	3-19-14
Usability Testing	20	4-10-14
Bug Squashing	30	4-27-14
Completed Project	50	4-28-14
Total:	149	

9. Proposed Budget:

Item	Price	Count	Totals
Unity Licenses	$5,000.00	1 (per team)	$5,000.00
Programmer Time	$75/hr	300	$22,500.00
Building Expenses	$900	3 months	$2,700.00
Janitorial	$40	1/month = 3	$120
Designer Timer	$50/hr	50	$2,500
Total			$32,820

Detailed Outline of the instructional flow of the program

1. Overarching description of the virtual world and its goals

The virtual world this game inhabits is a modern day apocalyptic survival horror, that is not too scary, for our main character who wants to survive by eating well. Since it is set in a survival horror the resources will be scarce and the enemies fierce. The enemies the player will encounter will be zombies. Zombies should be easily avoidable but can be overwhelming if the player is not attentive. While fighting is important keeping the player healthy and full of energy will be the highest priority.

The location of the virtual world will be a small American style town that will grow in size (the amount of area available to the player) when the player progresses from level to level. This will give the user access to better resources and more fearsome enemies. It is not a specific setting and should be generic enough to be just about anywhere in the USA. This should help the user associate with it better.

As a survivor the user will be trying to survive the zombies but the main focus of the game will be to remain healthy. The player will be given goals that not only guide them to keeping their character healthy but to increase their level of health.

2. Overall expected duration of curriculum

This curriculum should take six to eight hours of continuous play to master the topics and to meet all of the goals laid out for the player. This is because the learning content will be spread out gradually over time so the user can digest it easily.

3. Virtual world setting(s)

Diner - the User will start in a diner, this is a good place to start because there is food and there will be good and bad choices for the user to make. This will also be the tutorial level as it will be safe while you are inspecting/eating foods.

Town block - after leaving the diner the player will be able to explore the town a little bit. This will let them get used to combat and used to scrounging for good food. There will be people who teach them how to fight and knowledge about food.

Downtown - will be unlocked after the player has gotten used to combat and has a good grasp on what foods to use. Downtown will be tougher and will not have many other humans to help.

4. Introductory messages/Instructions students will see when entering the world

Title Scene
The intro title scene will contain a main screen that may be animated or static and will most likely be a view of part of the virtual world. The following title and text will be presented in the view: 1) "Zombie Survival" 2) "© 2014 Joshua Frisby, Michael McGrath, Josiah Rentschler" Additionally, the view will contain the following text: 1) "Click to continue"
Introductory Scene/Tutorial Scene
1) Character selection: This will be where the player selects from 1 of to available characters (1 male, 1 female).
Introductory Messages
The following message will be displayed to the player on entry into the virtual world: "Welcome to Zombie Survival! The purpose of the game is to survive by eating healthy and avoiding being eaten by zombies. Familiarize yourself with the controls and follow the in-game prompts so that you might survive."

Introduction of Controls
This message will be displayed to the user immediately following the previous introductory message and will be available to the player through the pause and/or main menu. Because the player may have the option to customize their controls, the following will reflect any changes the player will have made: 1) Movement:

- "W" = Move forward
- "A" = Move left
- "S" = Move back
- "D" = Move right
- "Space" = Jump

2) Interaction/Menu:
- "E" = Use/Interact
- "I" = Inventory menu
- "Esc" = Pause menu

3) Combat:
- "Left Mouse Button" = Fire 1
- "Right Mouse Button" = Fire 2

5. Actions and tools employed to achieve the goals

Tool List/Object List

HUD:
The General Heads Up Display (HUD) will be integrated into the players in-game view and will contain the following elements:
1. Health meter
2. Energy meter
3. Ammunition indicator
4. Survival time
5. Target reticle
6. Compass
7. Mini map
8. Equipped Weapon

Inventory (i.e. Backpack):
The inventory will be where the character stores all the provisions and supplies he/she has acquired. The inventory will be self contained (either as a separate scene or as a GUI element). The inventory will contain the following features:

1. List of items (this is the list of all items stored in inventory)
2. Ability to drag and rearrange items in the main list.
3. Drop current item (drops the current selected item)
4. Eat current item (makes the character eat the current item)
5. Item information (this is where the item information is)

Food Caches:
Food caches will be available to the character at various points in the game. Food caches will contain food items (or nothing) that the player can add to their inventory. Food cache interface will either be a separate scene or contained GUI element.
Each food cache will contain the following elements/features.
1. Add item to inventory (this option will add the selected item to the inventory of the player)
2. Item information (this section will allow the player to view the selected item's information)
3. Add all items to inventory (this option will add all of the items to the inventory of the

> player)
>
> Bed:
> The player will have access to beds or locations to sleep throughout the game. The purpose of a bed is to allow the player to recover energy points and for the player to be able to safely save their progress. After "sleeping" the character will be unable to sleep for some time, or not in the same location twice. A bed object/location will have the following elements/features:
> 1. Sleep (this will allow the character to sleep for a pre-determined amount of time, which will restore certain character resources.
> 2. Save (this option will allow the player to save their progress)

Character List

The game will contain two character profiles that the player may choose from when starting the game. The characters will differ in a few respects (such as voice) but will be mostly identical. This is achievable because the game is designed around a first-person approach, which means that the main camera will not show models of the character. The default character choices will be:
 	
1) Name: John Doe
   Gender: Male
 	
2) Name: Jane Doe
   Gender: Female
 	
The game may contain non playable characters (NPC's), but if so, will have a very minimal presence and interaction at most.

6. Quests:

Name
Diner Dash
Goal
Leave the diner within ten seconds of starting the game
Location
Diner
Initiator: How do players learn of the quest?
Self discovery
Ending: how do players demonstrate completion?

The quest is completed when players leave the diner immediately upon starting the game.
Tools/objects/NPCs involved: name/location/purpose
The diner is the location.
Expected time to complete quest
Less than ten seconds

Name
Truth begins in lies
Goal
Find the wise man
Location
Town Block
Initiator: How do players learn of the quest?
Self discovery
Ending: how do players demonstrate completion?
The quest is completed upon speaking with the wise man.
Tools/objects/NPCs involved: name/location/purpose
Wise Man located in the Town Block
Expected time to complete quest
Will vary from player to player; there is no time limit

Name
Elevate!
Goal
Go to a higher ground
Location

Downtown
Initiator: How do players learn of the quest?
Self discovery
Ending: how do players demonstrate completion?
If they choose to go to a higher ground they will complete this quest.
Tools/objects/NPCs involved: name/location/purpose
Any location that is elevated higher than the common ground; the player's current location on the y axis is compared against a set height variable
Expected time to complete quest
Varies from player to player

C) World Map(s)

World map:

Diner-

Located in the top right corner of the overworld map where the food cache is. A diner needs food to allow people to dine so it is the perfect location.

Town Block-
Located on the center right side of the overworld map. There is a block of buildings that form the town as well as a food cache. The Town Block is connected to the Diner and Downtown via a road path.
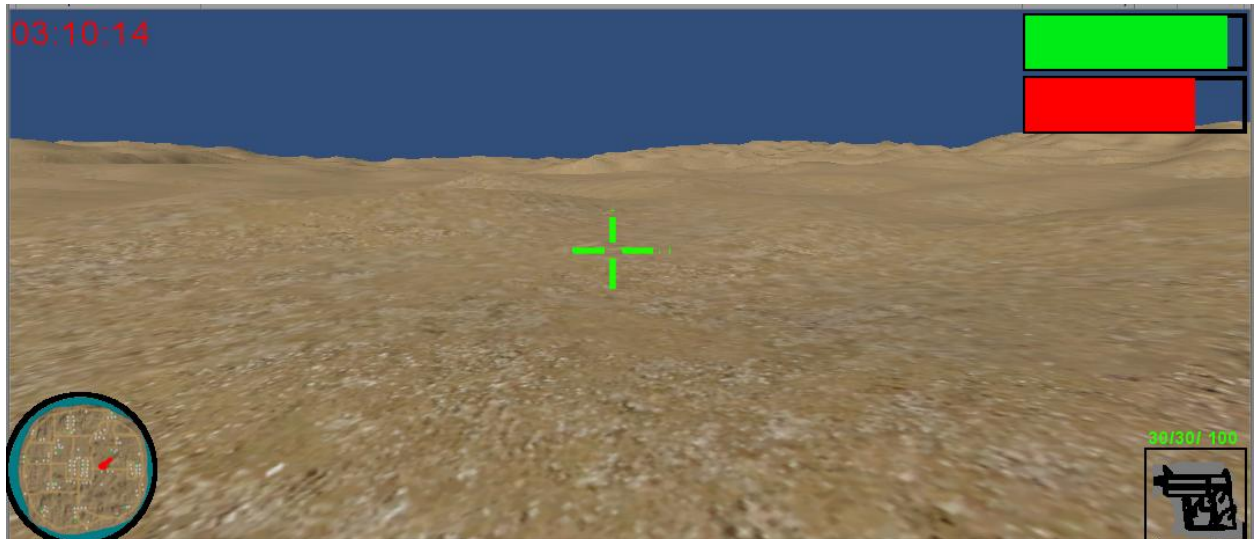
Downtown-
It is located directly in the center of the overworld. This is where most of the buildings are located as well. What else would you expect from a built up district?
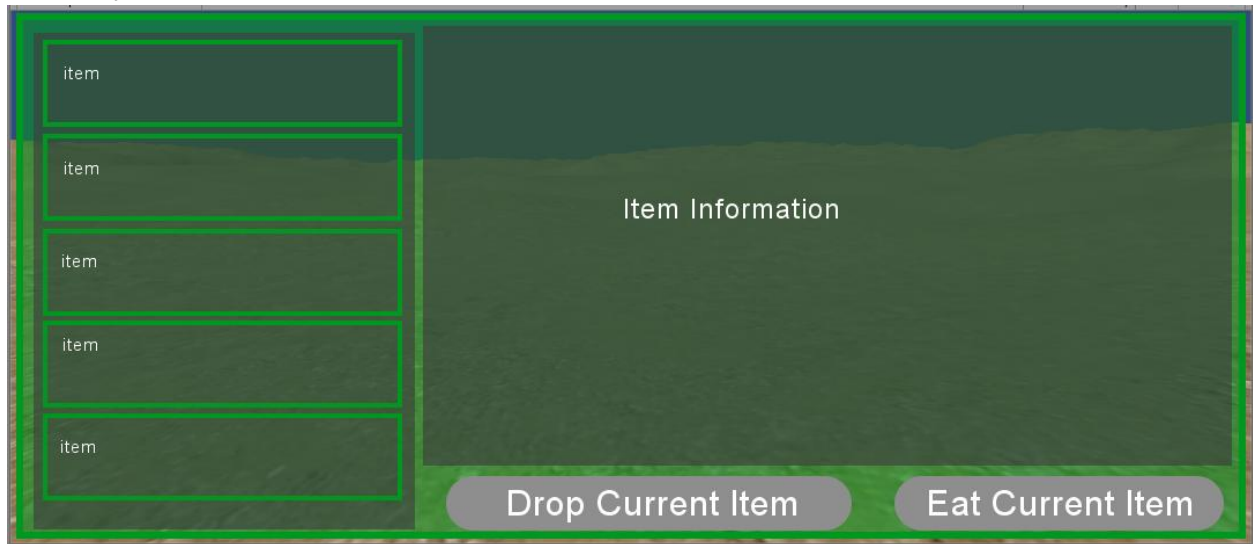
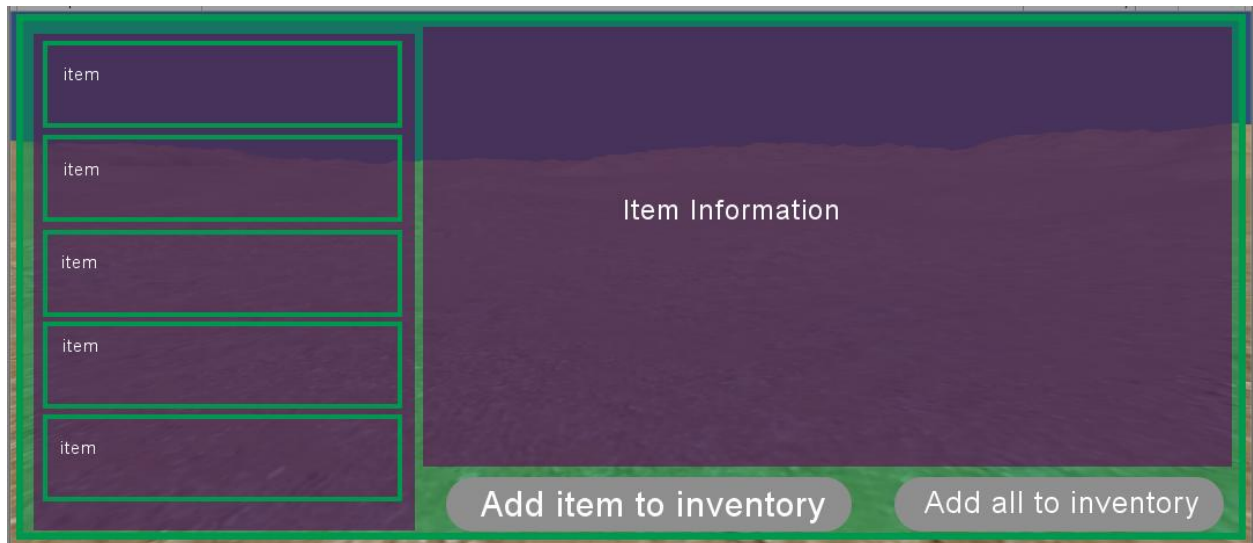**D) GUI mock-ups**

Title Screen:

General HUD:

Inventory GUI:

Food Cache GUI:

References:

"Guidelines for School Health Programs to Promote Lifelong Healthy Eating." Centers for Disease Control and Prevention. Centers for Disease Control and Prevention, 14 June 1996. Web. 8 Feb. 2014. <http://www.cdc.gov/mmwr/preview/mmwrhtml/00042446.htm>