Project Deliverable C: Design Criteria and Target Specifications

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Introduction:

In the document, the reader shall begin to understand that from the design needs there are specific design criterions for each need that will help the game developers. The reader shall also learn the functional, non-functional and constraints of the design for the needs specified. The read shall also see what prior projects have done with the use of virtual reality apps to help patients. The reader will also understand the ideal design specifications of the project.

Design Criteria

Interpreted Needs	Design Criteria
Game is easy to use	Head Movement Control Controller movement
Game is relaxing	Calming influence
Game is empowering	Feels strong
Game is enjoyable	Brings joy Brings positivity
Game is viable in tight spaces	Movement is minimal
Game is slow paced	Velocity(m/s) Story satisfies time constraint
Game is viable for the general population	Diversified
Game is distracting	User interacts with game
VR head moves when real head moves	Head Movement synced
Game is viable with one hand	Controller is easy to maneuver
Game is playable without the chance of nausea	Objects slow paced Movement slow paced Head movement is synced in game

Functional Requirements:

1. Game is to be used to relieve/distract chemotherapy and radiation patients with the emotions they face when going through the process
2. Operating conditions: one arm, in a small space

Non-Functional Requirements:

1. Aesthetically Pleasing
2. Game sounds/soundtracks are suitable for all ages
3. Game must not cause motions sickness to not disturb the patient.
4. Game should be distracting
5. Game should spread positivity

Constraints:

1. It is required that playing of the game takes a minimal movement.
2. The budget to create the game is $100.00.
3. Limited head movement in the game to reduce VR sickness.

Benchmarking

The Study: Virtual reality pain control during burn wound debridement in the hydrotank, had the best results

Specifications	Importance	Red = 1, Yellow =2, Green = 3		
Study		The effect of virtual reality on pain and range of motion in adults with burn injuries.	Virtual reality hypnosis for pain associated with recovery from physical trauma	Virtual reality pain control during burn wound debridement in the hydrotank.
Cost	5	N/A	N/A	N/A
Aesthetics	4	N/A	N/A	N/A
Controls	5	N/A	N/A	N/A
Movement	5	N/A	N/A	N/A
Speed	5	N/A	N/A	N/A
Distraction level from pain	4	31%	44%	50%
Diversity (ages)	2	35	31.8	27
Final Score		10	12	14

Engineering Design Specifications

Design Specifications	Relation (=, >, <)	Value	Units	Verification Method
Functional Requirements				
Game is to be used to relieve/distract chemotherapy and radiation patients with the emotions they face when going through the process	=	Yes	N/A	Test
Operating conditions: one arm, in a small space	=	1	N/A	Test
Non-Functional Requirements				
Aesthetically Pleasing	=	Yes	N/A	Analysis, Final Testing
Game sounds/soundtracks are suitable for all ages	=	Yes	N/A	Test, Analysis
Game must not cause motions sickness to not disturb the patient.	=	Yes	N/A	Test
Game should be distracting	=	Yes	N/A	Test
Game should spread positivity	=	Yes	N/A	Test
Constraints				
Game takes a minimal movement.	=	Yes	N/A	Analysis, Final Test
Cost	<	100	$	Estimate, Final check
Limited head movement in the game to reduce VR sickness.	=	Yes	N/A	Analysis, Final Check

Client Meeting Reflection:

Overall the meeting was beneficial for our product development. We learned many constraints such as the movement limitations and how chemotherapy affects the patient.The client meeting encouraged us to create some ideas to help the user have a more comfortable experience. For example, we learned that the fluid injected into Chemotherapy patients is typically cold, so it is a good idea to try to stimulate warmth somehow in the VR game to offset the cold sensation experienced by some patients. The client meeting also helped us define the design criteria and specification as during the meeting she outlined the fundamental background of chemotherapy/radiation as well as prior experience with Virtual Reality and the emotions experienced during the treatments for the patients and their loved ones.

Conclusion:

In conclusion, the client, Elish Pruner, specified many needs and problems associated with the VR app design which helps the design team define the design criteria and specifications. The client also helps with prior knowledge of different virtual reality experiences used in patient care which gives the group a framework of which to work with.