GNG 1103 F: Deliverable C (Design Criteria)

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Question	Customer Statement	Interpreted Need	Design criteria
User-specific needs	Organic Chemistry should be easier to understand	Create a VR game that is visually stimulating	Stimulation Visuals
	Users are 2nd year university students	Using chemistry principles, make the VR game interactive and challenging	Interactivity Difficulty
Design-specific needs	Has learning outcomes	Must include learning goals	Goal specification
	Must convey learning outcomes to the user	State the goal before the start of the game	Goal specification
	Interactive	User has to make choices in the game	Interactivity
	Scientifically accurate	The game has to summarize the reality of chemistry principles	Accuracy
	Must follow a colour scheme	Oxygen = red,Nitrogen = blue, Carbon = grey/black, Hydrogen = white	Accuracy

Learning outcomes	Estimate the amount and proportions of molecules present	Show proportions of species	Accomplishment identification Accuracy
	Explain the probabilistic nature of collisions	Show how collisions work	Accomplishment identification Accuracy
	Explain/ identify the requirements for a successful collision.	Show successful and unsuccessful collisions	Accomplishment identification Accuracy

Criteria	Priority #
Stimulation	3
Visuals	2
Interactivity	2
Difficulty	1
Goal specification	3
Accuracy	3
Accomplishment identification	2

Benchmarking

1- ChemReaX a chemical reaction modeling and simulation app from SciendBySimulation
https://chem.libretexts.org/Bookshelves/Ancillary_Materials/Interactive_Applications/ChemReaX%3A_Chemical_Reaction_Simulator/ChemReaX_-_Simulation_Dashboards/ChemReaX_-_General_Reactions

2- Organic Chemistry Visualized
https://play.google.com/store/apps/details?id=com.budgietainment.oc&hl=en

3- Functional Groups - Quiz about Organic Chemistry
https://play.google.com/store/apps/details?id=com.asmolgam.functional&hl=en_CA

Design criteria	1	2	3
Stimulation	Some	Some	None
Visuals	None	Some	Some
Interactivity	Choose chemicals and quantities	Choose chemicals	Choose chemicals
Difficulty	Too difficult	Simple	Mediocre
Goal specification	None	None	Defined
Accuracy	Yes	Somewhat	Yes
Accomplishment identification	None	None	Defined

Criteria evaluation system:

- High
- Average
- Low

Design criteria	1	2	3	Priority
Stimulation	2	2	1	3
Visuals	1	2	2	2
Interactivity	3	2	2	2
Difficulty	1	3	2	1
Goal specification	1	1	3	3
Accuracy	3	2	3	3
Accomplishment identification	1	1	3	1

Design criteria	1	2	3
Stimulation	6	6	3
Visuals	2	4	4
Interactivity	6	4	4
Difficulty	1	3	2
Goal specification	3	3	9
Accuracy	9	6	9
Accomplishment identification	1	1	3
Total	28	27	34

Design Specifications	Relations	Value	Units	Verification Method
Simulation	=	Yes	N/A	Test
Visuals	=	Yes	N/A	Test
Interactivity	=	Yes	N/A	Test
Difficulty	>	Yes	N/A	Test
Goal Specification	=	Yes	N/A	Test
Accuracy	=	Yes	N/A	Test
Accomplishment Identification	=	Yes	N/A	Test