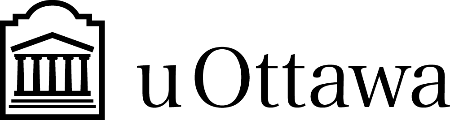
**GNG2101 Report**



**Project Deliverable C: Conceptual Design and Project Plan**

Submitted by

Team 4.2 - Immersive VR Experience

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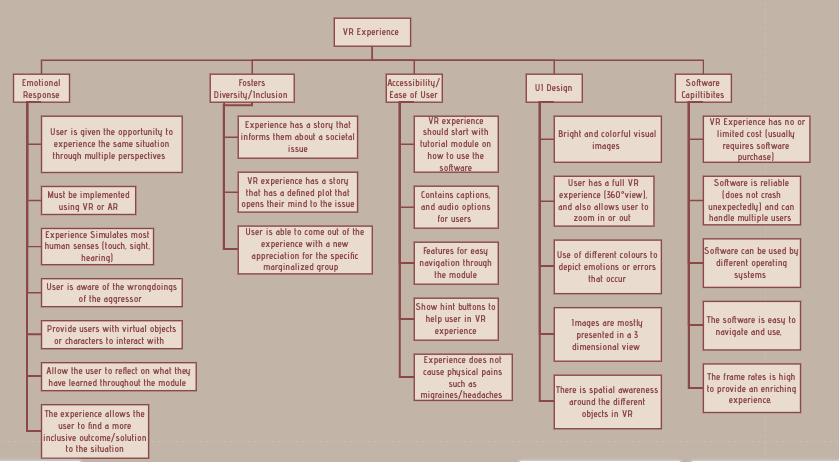
Faculty of Engineering

**Introduction**

In this deliverable, we will provide a conceptual design for our product and create a plan for completing multiple prototypes. The three main objectives for our deliverable is to make a conceptual design, create a project plan and lastly make a powerpoint to update our client on our 3 main project concepts as well as ask any questions that we may have. For our conceptual design, we plan to clarify the core functionality through a functional decomposition. Furthermore we plan to decide on 3 main project concepts through comprehensive thought analysis, target specifications, etc. For the last step, we plan to go further in depth on the concept we decide alongside its storyboard as well as any benefits and drawbacks.

**Defining Subsystems and Concepts**

We decided to divide this project into five subsystems: emotional response, diversity/inclusion, accessibility, UI design, and software capabilities. These subsystems are divided in order to properly plan and create a better experience for the user. The emotional response subsystem describes how the interactive experience can exhibit empathy in the user. The diversity/inclusion subsystem ensures that the storyboard provides an experience that contributes to the objective of the VR experience. The accessibility interactive subsystem outlines steps to ensure that there are features that are implemented that allow the experience to be adaptable to every user. The UI (User Interface) design subsystem is very critical in a VR simulation experience as it provides the user with a better enriching experience. Lastly, the software capabilities is another critical part to make sure that the VR functionality is up to standards avoiding crashes and lags when running the VR simulation.



| Concept Creator - Brevin Baskaran | 1. The second concept is a scenario in which the students are divided into groups and the student with the language barrier is felt left out. 2. The first concept puts the user in a situation where he/she is having trouble understanding the lecture. It allows the VR user to experience the troubles of having an enriching learning experience for a person with a language barrier. 3. The third scenario is a case in which the user is discriminated because of their sexual orientation and is being mocked upon for asking out a person of their same gender to prom. |
| --- | --- |
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| Concept Creator - Nicholas | 1. Unable to communicate with shoe store workers due to a language barrier.   The user will experience first hand what it is like to go to a shoe store and not be able to communicate with the employee about what shoe they want and what size they are.     1. Inability to play basketball at a park because of wheelchair disability.   Users will get to see what it is like to live in a wheelchair and not be able to participate in a basketball game at a park with friends due to being in a wheelchair.   1. Performing a speech with a speech impediment.   Users will experience what it is like to live with a stutter or a form of speech impediment and how difficult it is to perform a speech with these things. |
| Concept Creator - Henry | 1. Navigation of Campus/any location in a wheelchair   The user will take the point of view of someone using a wheelchair in both accessible and non accessible areas, and will be able to see the kind of challenges you may run into when using a wheelchair.  At the end there can be statistics given to the user such as the percentages of locations with proper accessibility to help the user reflect on the real world parallels.   1. Experiencing a scene involving racism against an individual.   The user is experiencing first hand the discrimination someone may face due to their race.  For example the player is put in a class and tries to make new friends, but notices that people are only hanging out with those of the same race.   1. Navigation from the perspective of a blind individual   The user is tasked with navigating to an area (such as a grocery store) but their vision is extremely blurry/short distance.  They must navigate based on sound cues and physical contact (a white cane). |
| Concept Creator - Uzair Mohiuddin | 1. Finding a peer who empathizes with your barrier  * The first concept presents a user who is on campus and is experiencing an inability to understand their peers. They find a peer who is able to speak the same language. The VR experience capturing this concept is intended to elicit empathy in the user towards having support through others who understand and comprehend their speech.      1. Student unable to access transportation due to inability to understand directions  * The second concept presents a user who is trying to access transportation (e.g., bus, train, etc.) but is unable to do so due to the language barriers. The VR experience is intended to elicit empathy towards a user who is new to a location but unable to travel due to lack of ability to comprehend the signs and directions.  1. User is unable to properly complete assignment due to inability to write the assessment in English  * The third concept is to display to the VR experience user the fear an individual would feel being unable to complete an assessment due to the language barrier. |
| Concept Creator - Reyaan | 1. User is a person of color and is facing discrimination for being different than others around them    1. The user experiences what it is like when all the others around you are of different color and look at you differently, making you feel secluded and lonely.    2. The user gets to feel what it is like to be in the shoes of a person of color. 2. User is part of a native tribe and experiences segregation for being part of an indigenous tribe and coming from a marginalized group    1. The user experiences what it is like to get employed as a part of a marginalized group. The user experiences going to an interview as a native and not being able to get hired because of blatant discrimination.      1. User experiences what it is like being a woman in a toxic masculine work environment    1. The user experiences what it is like being faced with sexist and masquarading remarks/insults alongside not having their views and voice heard. |
| Concept Creator - Jiachen | 1. User is having a conversation with classmates in a coffee bar. He is not very good at speaking English while his classmates are native English speakers.    1. User’s character had a pleasant conversation with his classmates. Now his classmates are discussing Apple events and new Apple products. User’s character is not familiar with words related to camera and computer. What should he do? 2. User is having an conversation with a homosexual neghbour in front of the elevator.    1. User’s character had a pleasant conversation with his neighbor. At the end of the conversation, the neghbour indicates that he is a homosexual. What will the user’s character do? 3. User is having dinner with colleagues in the office. He can only speak English and a little bit of French while his colleagues can speak English and French.    1. User’s character is having dinner with his colleagues. Colleagues are communicating in French. He wants to join in the conversation but he is also hesitant to interrupt the recent topic. There are several choices for the user to choose. For example, interrupt his colleagues using English, try to join in the topic using French, stay quiet. |

**Analysis and Evaluation**

Once each person devised three solutions, our team analyzed/evaluated each of them through a selection scoring matrix. From this we decided to rank the concepts of each group member from a scale to 1 to 5. From this selection matrix, it is seen that the first solution created is the one we should move forward.

| Criteria | Weighting/ Importance | Person | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Brevin | Jiachen | Uzair | Reyaan | Nick | Henry |
| Emotional Response (Empathy) | 5 | | 5 | | --- | | 4 | | 3 | | | 3 | | --- | | 4 | | 2 | | | 4 | | --- | | 3 | | 2 | | | 3 | | --- | | 4 | | 2 | | | 4 | | --- | | 4 | | 2 | | | 4 | | --- | | 4 | | 2 | |
| Effectiveness of Diversity and Inclusion | 5 | | 4 | | --- | | 5 | | 4 | | | 3 | | --- | | 2 | | 3 | | | 3 | | --- | | 4 | | 3 | | | 5 | | --- | | 4 | | 4 | | | 3 | | --- | | 3 | | 4 | | | 4 | | --- | | 4 | | 4 | |
| User Accessibility | 2 | | 5 | | --- | | 3 | | 5 | | | 4 | | --- | | 4 | | 3 | | | 4 | | --- | | 2 | | 3 | | | 4 | | --- | | 3 | | 3 | | | 4 | | --- | | 4 | | 3 | | | 4 | | --- | | 3 | | 3 | |
| Ease of UI Design/Development | 3 | | 4 | | --- | | 5 | | 3 | | | 4 | | --- | | 2 | | 3 | | | 4 | | --- | | 2 | | 2 | | | 4 | | --- | | 3 | | 4 | | | 4 | | --- | | 5 | | 3 | | | 4 | | --- | | 3 | | 4 | |
| User Engagement | 4 | | 5 | | --- | | 5 | | 4 | | | 4 | | --- | | 3 | | 3 | | | 4 | | --- | | 3 | | 2 | | | 4 | | --- | | 3 | | 2 | | | 4 | | --- | | 3 | | 3 | | | 4 | | --- | | 2 | | 4 | |
| Reflection Opportunities | 3 | | 5 | | --- | | 5 | | 4 | | | 4 | | --- | | 3 | | 3 | | | 4 | | --- | | 3 | | 2 | | | 4 | | --- | | 3 | | 2 | | | 4 | | --- | | 3 | | 3 | | | 4 | | --- | | 2 | | 4 | |
| Ease of Software Development for VR storyboard | 3 | | 4 | | --- | | 4 | | 4 | | | 4 | | --- | | 3 | | 3 | | | 4 | | --- | | 3 | | 4 | | | 4 | | --- | | 3 | | 2 | | | 4 | | --- | | 3 | | 3 | | | 4 | | --- | | 2 | | 4 | |
| **Total** | | | **116** | | --- | | 113 | | 94 | | | 90 | | --- | | 74 | | 73 | | | 95 | | --- | | 75 | | 59 | | | 100 | | --- | | 85 | | 68 | | | 95 | | --- | | 88 | | 75 | | | 100 | | --- | | 75 | | 88 | |

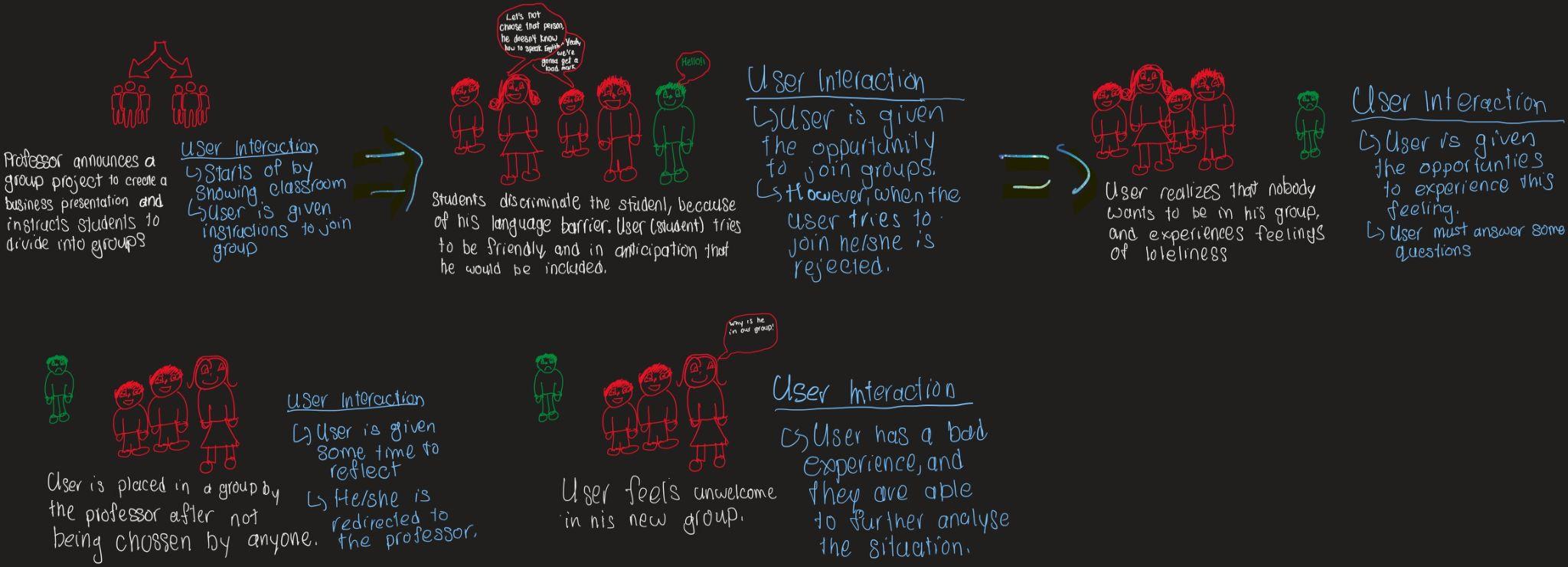
The primary benefit of the first solution, is that it is a very unique aspect of discrimination that many people are not aware of and usually dismiss. However, this experience allows the user to broaden their view on the aspects of inclusivity. This project concept allows the user to experience and understand the struggles that people face who are uncomfortable understanding a different language. This concept is specific to an international student who has just come to Canada, and is struggling to understand lectures. This storyboard provides a critical manner of evoking empathy from students and professors from universities. This storyboard gives the user a unique experience of immersing themselves in an experience that will open their eyes to this critical issue. Our team will try to make the transition to the storyboard to create the most interactive experience.

**Benefits and Drawbacks**

Each concept has its benefits and drawbacks that need to be considered when making the decision towards the final project concept.

| **Concepts** | **Pros** | **Cons** |
| --- | --- | --- |
| Experiencing exclusion from group work due to a Language Barrier | * Unique concept * Addresses an issue close to our group * Storyboard has an intricate plot * Allows the user to gain a unique POI | * Hard to implement |
| Facing Racial Discrimination on Campus | * Addresses a big issue in society * Allows the user to gain a unique POI | * Popular Concept * Hard to implement |
| Navigating through campus in a wheelchair | * Creative ways to implement this idea * Allows users to gain a glimpse at the difficulty of disabled individuals in their day-to-day life. * Allows the user to gain a unique POI | * Popular Concept * Could prove difficult in inducing an aspect of sympathy from the user |

**Final Concept Depiction**



This concept’s relationship to the target specifications, as fosters an environment that informs the end user about a form of discrimination that is not visible to the naked eye. This concept directly relates with our target specification of inducing empathic feelings and also allows the use of a full immersive experience. It allows the user to experience an unconscious bias geared toward students that have language barriers. Moreover, it fits our target specification of giving or informing the user about an invisible disability.

Wrike Snapshot Link: <https://www.wrike.com/workspace.htm?acc=4975842&wr=20#/folder/965918825/tableview?viewId=108819336>

**Conclusion**

In this deliverable our team created many different concepts to display what it is like to experience first hand discrimination. We evaluated as a team which ideas we liked the most and those selected ideas are in our presentation. In the end, we decided on Brevin’s idea regarding the student suffering from a language barrier and how other students did not want to work with that student. Through this deliverable, we were able to decide on a specific concept that we wanted to base our project off of which is extremely helpful for our future since everything we do now will be centered around this idea.