An Exploration of Overcrowded CPS Schools

4. Quality Education; VR Project in Unity emulating the emotional feeling of being in an overcrowded Chicago Public School.

Emma Casillas

Undergraduate Student , University of Illinois Chicago, emmalc4@uic.edu

Mia Calderon

Undergraduate Student, University of Illinois Chicago, mcalde34@uic.edu

Daria Cichon

Undergraduate Student, University of Illinois Chicago, dcicho2@uic.edu

Our VR Project focuses on underfunded CPS schools all across Chicago. We express the voices of thousands of children who go their whole educational lives lacking proper care through a visual narrative. We hope to push the visual aspects of an implemented 3D school environment to emphasize the lack of space and overcrowding of many CPS classrooms. Utilizing typography, we explore the mind of a student as we traverse a classroom unfit for the amount of kids who need to be educated. Our solution to the problem will focus on reorganizing classrooms and utilizing all aspects of even the smallest of classrooms. Mirroring the perspective of a child, the participant will navigate the experience of being in an overcrowded CPS classroom.

CCS CONCEPTS • Social and Professional Topics: User Characteristics: Age: Children • General and Reference: Cross-computing tools and techniques: Design • Human-centered Computing: Interaction Design

Additional Keywords and Phrases: Schooling, Overcrowding, Education, Children, Interactive Design

1 INTRODUCTION

Our goal with the creation of this project was always to create an emotionally driven experience. We aimed for full immersion; a truly encapsulating experience of being a child in an overcrowded CPS school. Deep, dark colors evoke fear. Loud, crushing walls with rattling 360∘ sound wracks fear through the user. Tying in with our choice of Greater Education, our solution was purely interior design based. With a simple movement of furniture, full utilization of even the smallest rooms, and welcoming decoration classrooms can accommodate more kids. We acknowledge that overcrowding runs far deeper through the educational system

than surface level organization or zoning. Therefore, smaller design decisions like our proposed classroom serve as a method of aiding in smoothing out the bumps in the rough bumpy hills of education.

2   CONCEPTS

The CCS Concepts we implemented were Social and Professional Topics: User Characteristics: Age: Children, General and Reference: Cross-computing tools and techniques: Design, and Human-centered Computing: Interaction Design. The Social and Professional Topics we implemented through the perspective of the user and all 3D objects making the height appear as that of a child. We wanted to express the voices of all of the children in the Chicago Public School system and also serve as a memory for those who have gone through a similar experience at that age. We heavily utilized design and typography for both the General and Reference and Human-centered Computing concepts. Typography in our project serves as one of the main vessels for delivering our facts, emotional environments, and solutions.

Our primary research focused on the number of students per classroom and Chicago Public Schools in particular. CPS is one of the main schooling systems in Chicago, housing students from beginning schooling until 12th grade. With CPS in particular, being a large city, one of the main issues it encounters is overcrowding. Many articles discussed and analyzed the topic of overcrowding.

> "CPS set the maximum class size at 28 for kindergarten and first, second and third grades. No more then 31 students should be in fourth, fifth, sixth, seven and eighth classrooms… And yet more than 51,000 CPS students were in classrooms that exceeded those standards." [1]

We thought it would be very important to share the voices of the children in these classrooms and to help create an accessible design solution for them all. One fact that influenced our decision to choose CPS specifically was not only because we are located in Chicago, but because Illinois is particularly different in their handling of class size issues.

> "Illinois is one of only 14 states across the country that doesn't have statewide legislation enforcing class size limits." [2]

Not only is CPS close to home for our team members, but it also houses so many children affected by what we portray in our project.

In our original sketches, we went through a lot of trial and error with our solution ideas. We were unsure how to approach a manageable, fast way to show how redecoration was all a classroom needed in order to be more functional. We stuck with our original wall of text and a somewhat visually similar classroom solution. We also had to navigate the process of creating visible, legible typography. In our sketches, the type is smaller, which needed to be adjusted in the final project.
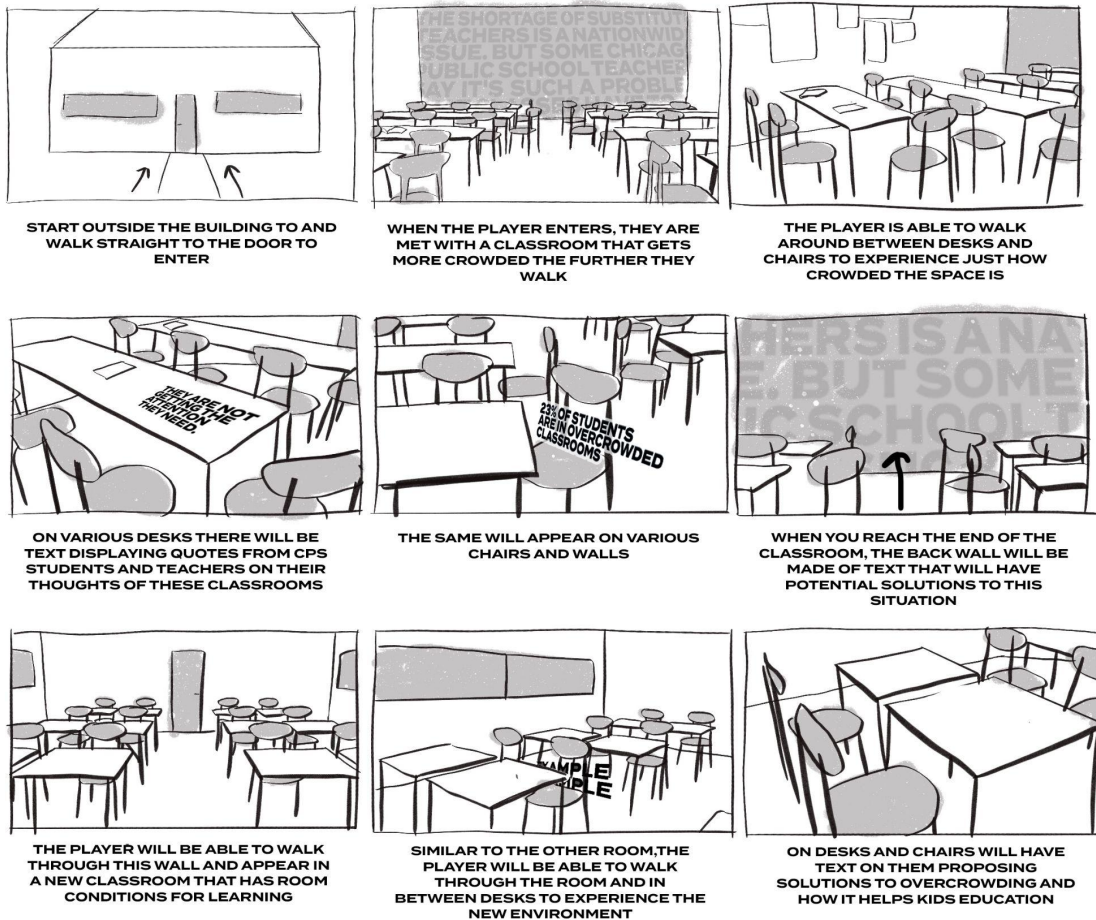
Figure 1: Original project sketches. 2022.

3 INTERACTION

Our project was presented in the CAVE2™ system at the University of Illinois Chicago. Our main form of interaction in our project is the walls moving in. In the initial classroom, the commands begin when the participant enters the room and continues as the participant walks through it. As the user walks closer to the end of the room, the walls are closed in almost to the first desks of the inner columns. This gives the effect that the user is a singular being stuck between the walls acting as a visualization of the anxiety that is caused by being overwhelmed by a room that is against them. Once at the end of the room, there is a moment of reflection powered by the large typography reading "CAPACITY" and other buzzwords that emote the biggest concerns for the classroom. Light also plays a big part in the design as we played around with different settings and points of illumination. The main goal was to make the classroom dreary and underlit. There was initially a possibility of using smaller light sources to act as lights that flicker and are unreliable.

In CPS classrooms, maintenance is a big point of quality so we wanted to show a classroom that wasn't being taken care of as well but realized that we wanted to focus on what teachers and school administrations could do with desk placements more so than the maintenance of the building by external sources. The biggest ones affected are the children and teachers, so we also wanted to be conscientious of the struggle of having to do a lot of work independently. The typography and walls are the main source of light in the initial room now and it is flooded with a bright blue overwhelming wall of typography. It is the only source of light and is far more dreary than its subsequent bright, colorful solution environment. The 3D models we utilized serve to emulate a school environment but balance out the huge typography surrounding the room.

Our project is separated into three different stages: school yard, destructive classroom, ideal classroom. The school yard displays the front of the school and a stone sign with the title "28/31 Elementary School". We used other presets such as a yellow school bus and materials to make the floor look like grass with a stone pavement as the walkway. The front of the school was built with one building stacked on top of each other to maintain the Chicago School architecture style that is a staple for older buildings in Chicago. This style is important as it teleports the user to a possibly familiar school building they grew up attending if they were raised in Chicago. The red brick exterior and seemingly endless amount of windows can be anxiety inducing to many who had bad experiences in the CPS school system but there is also a moment where the user can consider the possibility of a better quality of education for CPS students behind those glass panes. This is where the user then enters through the front door that has an audio trigger that sounds like a creaking door as they pass through. Immediately, they teleport to the initial classroom.

Teleportation is another main interaction in our project and it was used with writing scripts in Visual Studio and implementing them into Unity. The User and CAVE system are teleported to different rooms on contact with the collision box placed at the different points. The first one as mentioned is the door on the exterior of the school. One problem we encountered was proximity, so we had to play around with how large the collision box was and making sure the teleportation hit its target. The second instance of teleportation is when the user walks to the end of the room in the initial destructive classroom. There is a small collision box on the glowing wall of typography that is lowly placed on the bottom of the screen..This then introduces our final stage of the project, the design solution classroom.

The second room, the destructive room, is filled with many desks. The school chairs were found as a Unity asset. There is a surplus of desks and rows that show there are more than 28-31 students habitating the one classroom. The amount of desks is a literal translation for the amount of children and how overcrowding in school can be harmful in an already small room. The classroom is then set to get narrower as the user walks through. This aspect of the room getting narrower was the initial idea but we soon realized that having the two walls cave in would be more effective to give the idea that the room is getting smaller. With a focus on typography and a design based solution to overcrowding in public schools, we utilized the Internet to fully understand the statistics and reality of the situation the school system is in. We placed our text above the desks in a cream color with some dark blue words that stood out in the sentences. This is where we displayed the statistics of what the classrooms are declared by the school board to be. The requirements of "standard" classroom as declared by CPS are not being met and the requirements are deemed null in reality. They range in height and size to completely cover the room and further give the overwhelming affect a student may feel when in this classroom.

Figure 2: First classroom in 28/31 featuring facts and walls closing in. Photographed by Aaron Varilla. 2022.

4   Development/Technology

As the walls close, there is a sound that is triggered by the user entering the room. We used Audacity and free mp3 files of large stones being dragged to give the walls a sound. In Audacity, the mp3s were set to loop over two times with a fade in and fade out effect placed on the audio track. This allows for the Unity project play to sound like one big race of stone dragging in on the user. This process was also repeated for the sound in the design solution classroom. We found audio of an elementary school classroom and implemented it through when the participant entered the last room. The children we chose sound busy and engaged with their teacher which is what we designed the classroom to facilitate.

5   Solution

The third and final room, the design solution room, is much more spacious and encourages group work through the newly implemented desk layout. We rearranged the same desk and chairs into more collaborative positions, forming unified tables. The classroom is still small and the amount of chairs still offer enough room for over 30 kids, a number far over any legislative recommendation. The walls use typography in a colorful way to display what the walls should be filled with. This juxtaposes from the initial room as it is welcoming and decorated. Our solution recommends posters and works of the students to be put on the walls to be welcoming, childlike, and friendly. Assets that are readily available and cost nothing to teachers can be used to enhance a classroom that is being put under strenuous conditions.

Figure 3: Solution room in 28/31 featuring proposed typography of decorations and furniture. Photographed by Aaron Varilla. 2022.

Our project utilized the Unity game engine and Visual Studio for the main physical attributes. Besides that, we used Adobe Illustrator, Adobe Photoshop, and Autodesk Maya for the creation of all of our 3D typography and texture making. Utilizing the CAVE2 also meant making specific interactions apply to the CAVE2 remote and experience. This especially applied to our sound and making sure it really created the feeling of immersion.

6 CONCLUSION

Our project taught us not only a lot of new technologies, but also what a video game environment is like when working in a team. Though we were not sure how the outcome would be, we are still proud of the playable experience that came out of our efforts. Knowing what we know now, of course we would go back and work on the project more, add more details, and make different experiences. However, being that it was our first project, we are proud of what we did as we were learning along the way.

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