



PROJECT 3: NOVEL INTERFACES

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The Future of Glasses

PROJECT 3: NOVEL INTERFACES INTRODUCTION

Our problem domain started with the classroom setting. This physical environment was selected because it appeared to have a lot of potential problem or does not present itself as the most efficient use of a person's resources. The researchers decided to analyze the classrooms at the University of Wisconsin - Madison due to our familiarity with the setting as well as the desire to make improvements to a space that we occupy so much of our time in. The designers had a very general sense that there could be improvements for a given problem that could be discovered through the research process.

More specifically, our ethnography was conducted to see how we could come up with design ideas to help students use their most precious resource-- time-- most effectively. Our questions and observations were geared towards determining why and how often college students miss class. The researchers wanted to get to the root of low attendance rates and optimize how much information students retain when they actually view the lectures.

The people who interact with our physical environment are just as important as the setting itself. Through the whole process, we really wanted to connect with our participants to have the most compelling and custom design. The students we chose to participate had various majors and demographics. One female student is a graduating senior studying kinesiology, another student's is a male computer science student in his junior year and the last student is a female studying computer science and math graduating this year.

Our physical model illustrates a simplified version of actual classrooms we conducted our research in. The left portion shows the discussion section that lasted approximately 50 minutes from 1:20 pm -

2:10 pm on a Monday. The researcher was able to sit right behind the participant in the small room. The discussion section that had a smaller and more personal feel among the students. This provided diversity to our data since people act differently in a more intimate environment than in a large lecture hall. The participant was located on the very far right from the perspective of facing the front of the room. The other two participants were in the same lecture that lasted 75 minutes and started at 9:30 and ending at 10:45. The participants both sat in roughly the same area with the interviewer directly adjacent. The two participants were observed in a large lecture hall with 180 students and a lecturer.

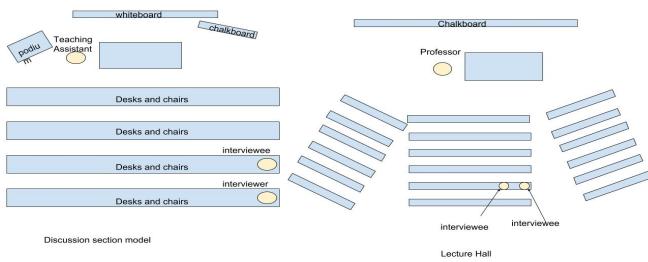


Figure 1 : Models

PROJECT 3: NOVEL INTERFACES UNDERSTANDING

After clearly defining our problem domain and what we would like to research, we gathered our participants. We decided to interview three college students at the University of Wisconsin - Madison. We picked students later in their college career since they have spent a significant amount of their time in the classroom environment and have enough experience in their college careers that they could identify some pain points.

After identifying our participants, the researchers figured out how to approach the participants to collect the best and most useful data for our study. This included crafting interview questions in advance that were geared towards unlocking pain points that the participants encountered. After asking for permission to follow them around and use any pictures or video content, a researcher was able to see exactly how they act in their environment. After completing the "fly on the wall" observation, we would follow up with an interview that consisted of our predetermined questions.

Next, it is time for the researchers to actually collect the data and meet with the participants. The researchers kept in mind that we needed to be very observant of all the details of our participants' actions. The length of the lecture time was just the right amount of time for the participant to feel comfortable in the environment and the observer to document a wide variety of actions from the participant. While collecting the data, we kept in mind that we are observing our environment and not being a part of it as a "fly on the wall." We also kept in mind that the interview portion was our



2: Classroom Setting

time to delve deep into the participants' potential pain points and lifestyle. To assist in later recall, a lot of pictures and videos were taken. The videos were then transcribed as a way to format our data.

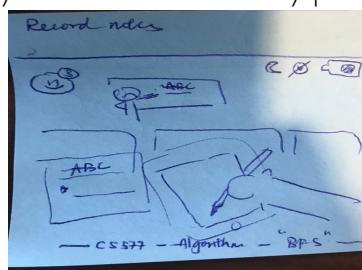
To find opportunities for change, we picked out pain points and key trends. As a group, we worked on an affinity diagram to analyze data including frustrations, suggested improvements, and quotes to brainstorm. The affinity diagram proved to be an effective way to analyze data since it was a way to gather thoughts and bounce ideas off our peer researchers. We also looked at trends that may create personas within our participant population to create features to address pain points. During the analysis, we took into consideration the next steps such as physical limits as well as creative limits. In this process we weeded out ideas such as an iris scanner due to the abstract and hard to conceive nature of this technology. Lastly, we wrapped up final thoughts and selected the best design ideas by telling stories and analyzing advantages and disadvantages of all the ideas.

PROJECT 3: NOVEL INTERFACES IDEATION

Our findings led us to designs that solve our **observed students' problems with attending lecture** and gaining the most information possible.

Our first design idea addresses the issue of missing class or certain parts of notes due to being preoccupied with distractions. We propose a **special pen** that students take notes with so the notes can be automatically uploaded to the cloud and accessed by their class friends. Students who miss class, particularly in our interviews due to weather or travel, would be able to download the notes and read them at a later time. Students who are sleepy during class and miss some parts of notes can also download the notes and fill in those parts that they missed.

A second design idea is **VR glasses** that allow students to view class in real-time when it is not feasible for them to attend. These glasses would come in handy in our observations of missing class due to travel or weather, as they could view it from any place and do not have to physically be there. If they miss an alarm or are too sick otherwise to leave



initial design idea

bed, they could stay in bed and watch lecture from home. In our interviews, one student said that being in a lecture hall was not too important to his learning, it is only essential that he would be able to take notes. This solution allows the students to retain capabilities of notetaking.

A third design idea is **AI-assisted notes** that act as a "study buddy" for students. The AI system could store all of a

student's notes for a particular class and, based off of them, generate study materials such as notecards or practice exam questions. The AI system would gather these notes in two ways: one, if the student takes handwritten notes, could have a special pen that they write notes with so that it can upload them to the cloud and detect words and two, if the student types notes, it could use the information as is. In an interview, one student said that he would do better if professors gave more study materials, which this AI would provide.

The researchers determined our final thoughts and selected the best design ideas. We told stories from our data and presented storyboards to visually show the appeal of selecting one design over the other to work on for our main focus. After analyzing the advantages and disadvantages of each design, we selected to pursue the VR glasses as the basis for our final solution. The reason we picked the VR glasses is the ability for glasses to add a new piece of technology to students lives that help them manage their time more effectively without missing out on valuable information that lecture provides.

PROJECT 3: NOVEL INTERFACES PROTOTYPING

After analyzing our observations and coming up with the major pain points that need attention, we decided to go ahead with VR Glasses idea since it addressed most of the pain points.

That said, we started to create a persona that would be an accurate representation of our users.

We didn't give our persona a specific name or gender because our infomercial was targeting college students and we felt that a name/gender would have distanced our audience from the average user of our product.

The persona(s) that we came up with were **college students** who are reluctant/unable to attend lectures due to physical restrictions and/or other inflexibilities, but at the same time really want to attend school lectures because they are afraid of missing lecture material.

PERSONA

Brief description of glasses	VR glasses that allows users to go to lectures wherever they are
One sentence description persona	college students who were reluctant/unable to attend lectures due to physical restrictions and/or other inflexibilities, but at the same time really want to attend school lectures because they are afraid of missing lecture material
Gender	<i>ii : Table of Persona Information</i>
Age	18-20 or even older
What motivates them?	Getting good grades. Not having to feel guilty about going to class
What do they fear most?	<ul style="list-style-type: none"> Not able to Graduate. Final Exams
Who is their hero?	People with jobs in their desired career path that are earning a steady income.
What is the primary reason why they will use the glasses?	Physical and personal circumstances can get in the way of them getting into class. They want to go to class but sometimes that isn't possible

We modeled our video over the persona that we created. To clearly demonstrate the stories of as many students

as possible, and their potential uses of the VR class glasses, we based our video off an infomercial-style campaign that shares success stories of using them. As the star of the infomercial, we created a "researcher" character who reappears between scenes and promotes the glasses.

What made this video idea clear was a storyboard that was created to visualize the possible scenes. Our team discussed the scenarios that we thought were good for the infomercial. In the storyboard, we designed many short example-use-case scenes to be interspersed between researcher scenes

These example-use-cases had the primary goal of showing reasons why students cannot attend class and instead need to use the glasses so that they can see what is going on in lecture. One of these example scenarios is a student stuck in traffic, on his way to class, who is late and is missing what is going on in class. He can put on the glasses and see what he is missing. He is able to watch the video from home, still in bed, without missing out on any of the information.

The style of action for these short, blurb-like promotions of the glasses is short and to the point. They were each filmed separately in different settings to show the flexibility that our product allows. Therefore, the production team moved around the city to film each one. We only have four people on the team and more stories than that to tell about figurative students, so actors reappeared as different characters in various scenes.

To tie all the example-use-cases together, a script was also created to be narrated over them. The narration was done by the "researcher" character that we created. The researcher first appears onscreen to tell viewers that he has solved a

PROJECT I: WEB-BASED SERVICES PROTOTYPING

common issue for college students. He then reappears following

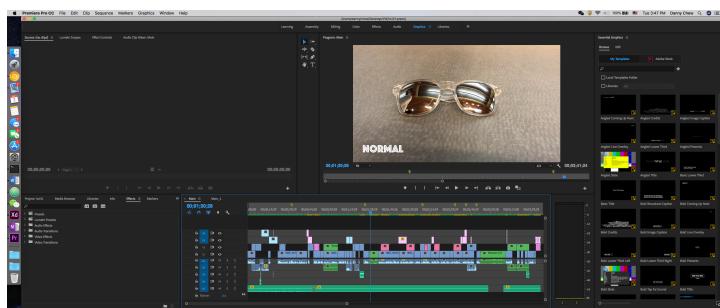
example use cases, to tell about the different styles in which the glasses come, and he tells more about the design and features of the glasses. We then show a 360-degree view of the lecture hall, which the glasses can provide to their users. Also in the process of promoting our product, the researcher tells viewers about various features for which the glasses provide. He also tells users about pricing, in true infomercial style.

After filming and getting the snippets that we needed, **Adobe Premiere Pro** was used to cut and merge the snippets. Music and sound effects were also added during here. Once we had the overall

structure and foundation of the video, **Adobe After Effects** was used to add holograms and prototypes of our product's interface.

Adobe After Effects CC

The video was then uploaded on the internet and shown to other students that fit the criteria of the persona. This was done so that we could get feedback which would allow us to evaluate our design ideas.



3 Video editing process using Premeir Pro

PROJECT 3: NOVEL INTERFACES FINAL SOLUTION

Our research process tells us that the best way to simulate the experience of class, without being in class, is VR glasses that show the wearer a real-time view of class. Our final solution is a pair of VR glasses that looks similar to sunglasses or 3D-movie glasses. We removed the lenses so that the eyes of the wearers can be seen.

We discussed many styles for our final glasses, including a “line” of glasses with various pairs of glasses that look similar and all perform the same function. However, for the purpose of consistency, we settled on a single pair of glasses.



We choose 3 features, in addition to the virtual presence in class, to implement in our final solution:

1) AR interface and gestures

By performing gestures with their hands,

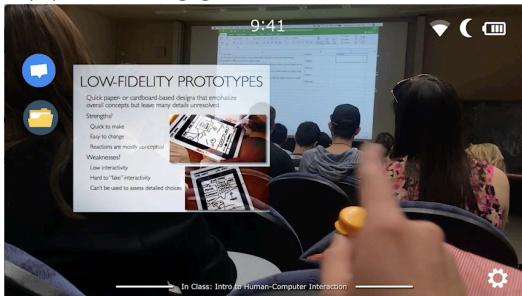


Figure 4 : Design of AR slides and gestures

user can efficiently carry out certain actions in the VR's operating system. Allow them to carry out tasks like

navigating through lecture slides and the glasses' file system.

2) An integrated video call system



Figure 5 : Design of Video call System

This video call feature would allow users to have discussions with other virtual classmates during class discussions. Allowing students to interact with each other without physically being in class.

3) Chat box



Figure 6 : Final Design of Chatbox

This chat box allows users to communicate and receive notifications from other students. This allows users to be notified about any updates without taking their eyes completely off the lecture.

PROJECT 3: NOVEL INTERFACES FINAL SOLUTION

After developing our final solution and video to convey our message, we wanted to receive follow up feedback from our original participants. The researchers met up with them one more time in order to show them our video that highlights the features and usability of our final solution. After the video was displayed, we administered an exit survey to see if our solution helped breakdown some of the user's pain points that were discovered in the original design ethnography. Our data supports that our idea would be a technology that students are willing to adopt.

How often do you think you would use these glasses in an average (M-F)?



Above: Survey results supporting participants' use of the VR glasses