

LumenEd: Localized and Cost-Effective Education

India

Oberlin College

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Section I

Project Goals: LumenEd was a project aiming to provide digital tools for teachers in low-income schools in New Delhi, India. Our platform – which consists of specialized education content, a video pen pal program, and a custom-built device to display video materials--was designed to increase student engagement and participation in classrooms to enable better learning.

Other Funding Sources: We also received funding from Oberlin College's Creativity and Leadership Fund, the Bonner Center for Service and Learning at Oberlin, and the LaunchU entrepreneurial venture prize at Oberlin.

Project Details: We have been working on this project from the summer of 2013, along with four other team members. Our work before this summer included getting in touch with partner organizations and schools to implement the program, and refining our ideas for our pilot program. The first two months of this summer were spent developing and assembling our device, collecting and organizing content for our library, and getting in touch with schools in the US for the pen pal program. Building the device was the most difficult part of the project, and took us much longer than expected. We had hoped to finish assembling the devices and handing them out to teachers in July, however, we could only do so at the end of August.

It is worth touching briefly on some of the issues we faced, as we spent a good amount of time this summer ironing them out. All of our components were retail parts that needed to be assembled together to make the final device, along with a custom touchscreen interface developed for our devices. Connecting all the parts together proved to be challenging, necessitating a complex custom-designed power circuit. Some of the components also did not work well together, often requiring a few days to isolate and fix the problem. In the end, however, we had a device with a projector, speakers, mini-PC, and battery in a portable, laser-cut enclosure. This completed our vision of a device designed specifically for teachers in classrooms. The only aspect we could not finish in time was getting the camera and microphone to work to record videos in the classrooms. However, this is a software limitation and we are working to enable this through an update for the devices.

Another aspect of our project was creating a library of open-source digital content for teachers to easily find relevant videos for their curricula. We compiled over 1500 videos from different open-source providers into a database organized by grade, language, subject, topic, and length. This searchable database was made available to teachers to map content for their classes. We also worked actively with the teachers to find relevant videos for their weekly lesson plans outside of our library; these included stories, videos on moral values, and videos promoting artistic expression.

The final part of our project was the pen-pal program. For this, we connected classes at the same grade level in the US with our six classrooms in India. These partner classrooms recorded and exchanged videos on a weekly basis. Although we only had two classrooms doing this for 3 weeks this past summer, the program will run this Fall (Sep-Dec) in all the classrooms. The classrooms planned and recorded their videos on their own with their teachers, which led to a wide variety of topics and styles. Our main role was to put the teachers in contact, help with recording and video editing if necessary, provide subtitling where language or accent was a barrier, and do anything else to keep the conversations going.

The other major unanticipated difficulty we faced was with our budget. Importing electronics into India incurred a customs tax of 30%, which increased the budget substantially. Moreover, the additional prototyping expenses added to our costs.

Based on teacher feedback and our observations in classrooms, the device was very effective. The projector was bright enough even in daylight and the audio was loud enough for the noisiest environments. The teachers found audiovisual aids to be very helpful, especially as the content was relevant to the subject matter being taught. Finally, the pen pal program led to an unprecedented exposure for the kids and increased active participation in the classroom.

Although we had planned on the devices being used in one classroom each, teachers actually shared the device in some of the schools. Since the device is battery powered and portable, they could just carry it from classroom to classroom. This was especially useful for schools with a shortage of teachers, as teachers would use the device to play content to kids in one classroom while teaching in another. Keeping these points in mind, our project has likely impacted the learning of 200-400 2nd- 6th grade kids for the coming year just using the six devices.

This past summer was a proof-of-concept of our idea. We have shown that it is possible to engineer a device for the classroom at a relatively low cost, and that such a device can be effectively used by teachers to improve learning. This is done through audiovisual tools, as well as a pen-pal program that increased student participation and allowed for student expression. We are now looking to expand the scope of our project substantially. This would involve designing a new device with the same features but suitable for manufacturing. We have already established relations with several organizations in India who are willing to implement these devices in their schools. Even longer term, we are looking to expand to different countries, both for the device itself as well as the pen pal program.

Section II

For our project, we think of peace in two different but interconnected ways. The first is through education; by building knowledge and understanding, and especially in the developing world, by breaking down barriers. The second is by connecting classrooms across the world, by inducing interactions that are long-lasting and meaningful, and by allowing people to recognize similarities and share their differences.

Our project contributes to peace in the short-term by providing educational opportunities to kids that never had them, and by connecting communities that never interacted in the past. Education promotes understanding, respect for others, and in a world increasingly driven by knowledge, provides economic opportunities that open up a whole new world. Through our pen-pal program, we hope to build lasting relationships between classrooms from diverse backgrounds, allowing them to interact with the global community and providing exposure to a culture that they would only have learned about before.

Through our work this summer, we experienced first hand the state of education for low income kids in India. Reading reports on them is one thing, but actually working with children and teachers in low-income schools really opened our eyes to the challenges to quality education. The lack of resources faced by schools is massive, but at the same time, the passion of some of the teachers and the dedication shown by students is unmistakable. This only served to strengthen our belief that motivated teachers are needed to teach students, and teachers can benefit from tools and resources they never had access to. On a more personal note, the project really motivated all of us to continue working on the project in the future.

Personal Statement: "The knowledge and resources that a lot of us take for granted are still a distant dream for many in the developing world. Through this project I experienced first-hand the benefits of educational tools and the positive outcome they can have on children's learning." -Shiva Mandala

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Figure 1: Prakash showing one of the classrooms their pen-pal video on the device



Figure 2: Shiva interacting with kids during an activity



Figure 3: Thomas Kreek, another team member, poses with some kids