1. Introduction

Young underprivileged students are adversely affected by having to learn online because of a lack of stable high-speed Internet and because they lack the knowledge and support at home needed to adapt when the Internet fails. School systems were forced to adapt to new styles of teaching due to the COVID pandemic starting around April of 2020. While colleges have been using resources for online learning for decades, grade schools are not so fortunate. The shift in teaching style is affecting students' ability to learn. Younger students are struggling the most with the shift to virtual or hybrid learning. If the student encounters a technical problem, there isn't much they can do about it. The student will likely ask their parents, who might lack the troubleshooting knowledge to fix the problem. The next course of action is to contact the teacher, who, like the parent, likely lacks the skill necessary to deal with a technical issue. The other half of the problem is the lack of stable high-speed internet access at home for lower income families. Roughly 40% of students from low-income homes must complete their homework on public internet connections. These connections tend to have slow connections when many people are on at one time, and frequently there is a time limit as well. A young student relies on their parents or a guardian to take them to public places, which might not always be possible. The solution is a student facing app and a teacher/admin app called Inclusive Classroom. The student app will have a simple UI that is easy to use for children. It will be a native app so that it can run without needing internet access. The student software will have a high level of automation, such as uploading and downloading files, and zipping and unzipping files to make things as easy for the student as possible. The teacher app will not need to be constrained to a certain device since a teacher will likely have good internet access at work. Teachers will be able to log in on any device via login and password. The teacher interface will be designed with convention over configuration in mind to keep things simple for the student.

2. Inclusive Classroom Product Description

Inclusive Classroom's (IC) primary goal is to increase the accessibility of online learning to low-income students. Our solution is a two-pronged approach. The two primary sections will be the student-side flow and the teacher-side flow. The student side will have the ability to passively download and upload assignments and lectures. We will also be attaching a timestamp to completed assignments to enable teachers to determine whether or not an assignment has been completed in time. The major goal of the teacher-side flow will be to allow the teacher to interact with these students with as little headache as possible. This will be done by automating processes for uploading lectures and sending notifications of live status to students. The teacher will also be able to easily review the timestamp associated with the assignment.

2.1. Key Product Features and Capabilities
2.2. Major Components (Hardware/Software)

3. Identification of Case Study

4. X Product Prototype Design

4.1. Prototype Architecture (Hardware/Software)
4.2. Prototype Features and Capabilities
4.3. Prototype Development Challenges

5. Glossary

5.1. High-speed Internet - Internet with consistent download speeds of at least 3.8 Mbps (Zoom)
5.2. English as a Second Language (ESL)
5.3. Family Educational Rights and Privacy Act (FERPA) - Federal law that protects the privacy of student education records
5.4. Google Classroom - "Free web service developed by Google for schools that aims to simplify creating, distributing, and grading assignments" (Google)
5.5. littleLearners - Former CS 410 group solution that emphasises simple UI for students in the K-5 age range (Del Razo)
5.6. Stable Internet - Internet with less than 1% dropped packets (ICTP)

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