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Subject: High School Hack-A-Thon Ideas
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Here is the list i complied for some ideas. They vary on different levels of difficulty and some have hardware (phones, smart watches, 3d printer) integrations. None of these are projects that we need or would use, more just fun ideas around parts of our industry. If you need more detail or guidance on any of them let me know.

Digital Healthcare/Healthcare Education

“Personalized" Health Education Training

- Develop an app or platform that tailors’ health education quizzes to users based on inputting of a virtual patients age, health conditions, family history, etc. The platform could include videos, quizzes, and gamified learning modules. This may also have an option for “randomly generating” a patient that will us AI to generate the inputs as well.

AI-powered Symptom Checker

- Create an AI-driven chatbot that helps users identify potential health issues based on their symptoms and provides basic guidance on whether to seek professional medical attention.

Mental Health Companion App

- Build an app that provides mindfulness exercises, mood tracking, and access to mental health resources. Integrate a peer-support feature (that may be anonymous or if both users chose, share details like username and avatar) for community building and reduce stigma around mental health.

Accessible Health Literacy Tool

- Design an app or website that simplifies complex medical terms and instructions into easy-to-understand language. Include features like language translation and voice-to-text for those who speak a different language or have disabilities or low literacy.

Remote Patient Monitoring Dashboard

- Develop a platform for caregivers and doctors to monitor patients' health metrics remotely. Integrate wearable devices to track vitals like heart rate, oxygen saturation, and glucose levels in real time.

Emergency Response Assistant

- Create an app that guides users through first aid or CPR procedures in emergencies. Include voice prompts, visual aids, and geolocation to alert nearby emergency services.

Health Habit Tracker for Chronic Illness

- Build an app specifically for patients managing chronic illnesses like diabetes or hypertension. Include features like medication reminders, diet tracking, and symptom logging.

Interactive Public Health Awareness Campaign

- Develop an interactive and immersive platform (via VR, AR, or gamified web apps) that simulates real-world scenarios to raise awareness about public health issues in an exciting, engaging, and gamified way. This tool can be used in schools, community centers, or public events to encourage learning and behavior change.

Digital with Integrated Physical/Wearable Healthcare Education

Wearable Vital Sign Simulator

- Develop an app for a wearable device (like a smartwatch or chest strap) that simulates real-time vital signs such as heart rate, respiratory rate, and blood pressure. The app can be externally controlled to mimic various patient scenarios for standardized patients (an actor pretending to be sick for training in medical schools) exams.

Smart Skin Patch for Trauma Cases

- Design a smart patch that attaches to the skin and mimics conditions like bruises, rashes, or burns. Sensors in the patch could detect how the student examines the area and provide feedback on their technique. This can be done with something like a flexible LED strip, a smart designer for 3d printing, or even a smartphone or tablet placed on a strap.

AI-powered Symptom Communicator

- Create a system where standardized patients (an actor pretending to be sick for training in medical schools) exams wear a microphone (or uses an app on a smartphone/tablet) that analyzes the student's questions and responses. Use AI to adjust the "patient's" verbal (giving them feedback through an earpiece/headphone) and physical symptoms (changing a patient monitor) dynamically based on the scenario progression.

Sensor-Integrated Physical Exam Training

- Design pressure-sensitive pads or gloves that a standardized patient wears to detect and measure the force applied during physical examinations, such as abdominal palpation, to ensure proper technique.

Smart Respiratory Belt

- Build a respiratory belt for standardized patients that mimics breathing patterns of various respiratory conditions (e.g., asthma, COPD). The belt could also track how effectively the student identifies abnormalities.

Gesture Recognition for Neurological Exams

- Implement a device with motion sensors (e.g., accelerometers) in a wearable device to detect and evaluate the accuracy of student-performed neurological exams, such as reflex testing or range-of-motion assessments.

Real-time Feedback for Communication Skills

- Equip standardized patients (an actor pretending to be sick for training in medical schools) with smart glasses or a headset with a holster for a smartphone that uses emotion-detection AI to analyze facial expressions, tone, and word choices in real time, providing feedback on empathy and communication effectiveness.

Dynamic Wound and Injury Simulation

- Use augmented reality (AR) to create dynamic wounds or injuries on a standardized patient (an actor pretending to be sick for training in medical schools). The injuries could "change" over time based on the student’s treatment actions, simulating real-life scenarios.

Healthcare Hospital Discharge Helpers

Personalized Discharge Assistant App

- Develop an app that tailors discharge instructions to the patient’s medical condition, literacy level, and preferred language. The app could include videos, voiceovers, and interactive FAQs to ensure comprehension.

Smart Discharge Document Generator

- Build a tool that generates user-friendly discharge summaries, integrating visual aids (e.g., diagrams, infographics) and auto-translations for non-native speakers. Include QR codes for accessing detailed instructions online. The discharge documents may even be AI generated based on the user’s eletronic medical record.

AI-powered Post-Discharge Communication Bot

- Build an AI chatbot that patients can interact with after discharge to clarify instructions, track symptoms, or answer common questions about recovery.

Customizable Recovery Tracker

- Develop an app that breaks down the discharge plan into manageable daily tasks. Patients can log their progress, receive reminders, and report issues that might automatically notify their healthcare provider.

Family and Caregiver Education Portal

- Create a digital platform that shares discharge instructions with a patient’s family or caregivers, including step-by-step care guidance and video tutorials for assisting the patient at home.

Condition-specific Discharge Assistant

- Build a tool designed specifically for patients with complex conditions (e.g., heart failure, diabetes). The platform could simulate scenarios, like what to do in case of complications, through interactive decision trees.

Voice-Activated Home Assistant Integration

- Develop a skill or feature for smart home devices (e.g., Alexa, Google Home) to guide patient's post-discharge. Patients can ask the device questions about their recovery plan, medications, or follow-up appointments.

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