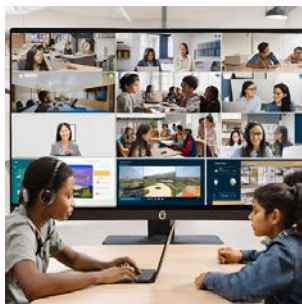# MM7: SDG3 SPACE4SDGS HEALTH AND WELL-BEING

SDG 4 – Quality Education

- Design a satellite-based learning platform that connects students in remote or underserved areas to quality educational resources and virtual classrooms.

Challenge

Imagine that you live in a remote area with limited access to schools, libraries, or teachers. Many students in rural areas face challenges accessing education due to distance, lack of resources, and limited internet connectivity. In this project, your mission is to create a satellite-based learning platform that allows students in these areas to join virtual classrooms, access educational materials, and interact with teachers and peers. With satellite technology, learning becomes accessible to everyone, anywhere.

Considerations

- User-Friendly Design: Make it simple for students to navigate the platform, even with limited technology skills.
- Inclusive Resources: Provide materials for a wide range of subjects and levels, from early reading to advanced science.
- Low Bandwidth Optimisation: Ensure the platform works smoothly, even with limited or slow connections.
- Offline Functionality: Allow students to download and store materials for later use if internet access becomes unavailable.
- Data Privacy: Implement safe, private ways to store student data, ensuring only teachers and authorised personnel can access it.

Background

In many parts of the world, access to quality education remains a challenge, especially in remote or underserved areas. Millions of students face obstacles such as lack of schools, limited resources, and no internet connection, all of which make it difficult to learn and connect with teachers or classmates. For these students, the distance to school might be too far, teachers may be in short supply, or the classrooms may not have up-to-date materials. This situation leads to gaps in learning and keeps students from reaching their full potential. SDG 4: Quality Education aims to ensure that all young people have access to inclusive and quality education, regardless of where they live.

One way to address this challenge is through satellite-based education platforms, which use satellite technology to connect students to virtual classrooms and digital resources. Unlike regular internet that relies on cables, satellites provide connections from space, making it

possible to reach even the most isolated areas. For students in remote places, this technology can open the door to a world of learning materials, online classes, and interaction with teachers and peers. It also ensures that education continues even in emergencies, like after natural disasters, when other communication methods may not work.

Satellite-based education platforms have the potential to transform lives by creating equal learning opportunities for all. Through your work on this project, consider how your design could help students overcome the barriers to quality education, giving them the tools they need to succeed in school and beyond.

Your Mission

Imagine a platform that gives students the chance to attend virtual classes, watch video lessons, and even submit assignments—all with the support of satellite technology. Such a platform would make it possible for students in remote areas to study just like those in big cities, regardless of where they live. However, designing this platform involves more than just technology. It requires understanding the specific needs of students in isolated communities, like adapting to lower levels of internet speed, making the interface easy to use, and providing resources in multiple languages. It's also essential to think about the privacy of student information, especially for young people new to online learning.

Questions to Consider

1. Understand the Users:
   - Who are the students who will benefit most from this platform? Consider students in rural areas, areas with limited school facilities, or places without internet access.
   - What devices are likely available to these students?
   - Think about options like simple tablets or shared family devices.
2. Design the Platform Features:
   - Virtual Classrooms: Include a feature for students to join live or recorded classes with teachers.
   - Educational Resources: Design an easy way for students to access materials like books, videos, quizzes, and practice activities.
   - Offline Access: Allow students to download content to access lessons offline when the internet is unavailable.
   - Interactive Assignments: Create a way for students to submit assignments, take quizzes, and track their progress.
3. Utilize Satellite Technology:
   - Consider how satellites can provide internet where traditional networks don't reach. This could mean stable connections during emergencies and consistent service for areas without cellular or cable networks.
   - Explore how satellite-based education could remain reliable and uninterrupted even in areas affected by natural disasters.
4. Prioritise Accessibility and Inclusivity:
   - Make sure the design is accessible for students of all reading levels and comfortable for users with limited technology experience.
   - Think about language and cultural factors to ensure the platform is useful for diverse users, including those who may not speak the same language.

Design Process Overview

Step 1: Introduction: What is the available and Who are your users?
- Explore examples of satellite and app solutions for supporting education
- Think about how space technology can gather different data

Step 2: Empathy
- Create user profiles for the people you want to help. What are their challenges, and what would help improve their lives?

Step 3: Defining the Problem
- Define the main problem that your project will solve. For example, is it access to education, markets, weather information for farming, or something else?

Step 4: Ideate
- Brainstorm different ideas for how your system could work. How would people use it? What kind of information would it provide?

Step 5: Ideate 2 – Good Idea / Bad Idea
- Refine your ideas. Focus on the most promising ones and think about how they could be even better or more accessible.

Step 6: Prototype
- Create a model or sketch of your satellite system or app. This could include the type of information it provides, how people interact with it, and what it looks like.

Step 7: Test
- Share your prototype with others to get feedback. Use their suggestions to make improvements and ensure it's easy to understand for your users

Deliverables
- User Profile: A description of a typical farmer and their needs.
- System Overview: A one-page summary explaining how your system uses satellite data to support sustainable agriculture.
- Prototype: A simple model or mock-up, such as a sketch or digital layout.
- Presentation: Share your system's impact on reducing hunger through improved agriculture

Each step will take one or more lessons and your teacher will also guide you with lessons and resources from the 'Space Design Challenge Problem to Pitch' Module

The United Nations Office for Outer Space Affairs (UNOOSA) works to promote international cooperation in the peaceful use and exploration of space, and in the utilisation of space science and technology for sustainable economic and social development. https://www.unoosa.org/oosa/en/ourwork/space4sdgs/sdg1.html

VISIT

Step 1: Introduction: What is the available and Who are your users?

- Use the Internet to explore examples of satellite and app solutions that support education
- Think about how space technology can reach people in ways that other services can't.

Step 2: Empathy: Create user profiles for the people you want to help. What are their challenges, and what would help improve their lives?

Support: Use the resources in MM7: Problem to Pitch Space Design Challenge, Lesson 2, Empathy

These prompts encourage learners to think about the experiences, needs, and emotions of people living in remote or underserved areas, helping them design an educational platform

User Persona Prompts for users of an education platform designed for remote learning

Identifying Student Needs
- Who are the students who will benefit most from this platform? Consider students who live far from schools or those in rural or isolated communities.
- What are some reasons these students might struggle to access quality education? Think about factors like long distances to schools, lack of internet, or limited school supplies.

Understanding Daily Life in Remote Areas
- Imagine a typical school day for a student living in a remote village. How might their day be different from that of a student in a city?
- What challenges might they face in attending school or keeping up with lessons? Think about weather, transportation, and the availability of teachers.

Different Users, Different Challenges
- Think about how different groups of students might use this learning platform. How might younger students, teens, or students with disabilities need different features?
- How might students with limited experience using digital devices feel about learning online? What features could make the platform easier for them?

Learning Needs in Isolated Communities
- What subjects or skills might be especially important for students in remote areas? Consider things like language, math, science, and practical skills for local jobs or farming.
- How could this platform provide extra support for students who need help catching up on basic reading or math skills?

Studying Without Internet Access
- How could students use the platform if they have limited or no internet access during certain times of the day?
- What kinds of features would be useful for students who can only go online occasionally, like downloading materials for offline study?

Interactive and Engaging Learning
- Imagine being a student in a remote area using this platform. What kind of activities would make learning fun and engaging?
- How could you include interactive elements like quizzes, video lessons, or virtual discussions with classmates or teachers?

Language, Literacy, and Accessibility
- Think about students who speak different languages or who may be new to reading. How could you design features that help all students understand and use the platform?
- What kinds of symbols, icons, or voice options could help students with limited literacy or different learning styles?

Building Trust in Technology
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- If students and their families are unfamiliar with digital education, what might help them feel more comfortable using the platform?
- What could you include to make students feel secure, like privacy settings for their personal information or a welcome tutorial?

Teachers as Users

- Consider how teachers might use the platform to connect with students in remote areas. How could teachers use features like virtual classrooms, homework assignments, or progress tracking?
- What tools or resources could help teachers who may be unfamiliar with online teaching but want to support their students effectively?

Feedback for Improvement

- What questions could you ask students and teachers to understand if the platform meets their needs?
- How might you use feedback to improve the platform's design, features, or ease of use? Think about special features that could make their experience better.

Creating User Profiles

After working through the prompts, ask learners to create a user profile for a learner or educator who might use the system. This can include:

- Name, age, and location of the user
- A description of their daily challenges and pain points
- Technology they have access to and comfort level with digital tools
- Their specific learning or teaching needs
- An example of how they would use the system to access education

Step 3: Defining the Problem: Define the main problem that your project will solve. For example, is it connecting people with healthcare professionals, submitting health data

Support: Use the resources in MM7: Problem to Pitch Space Design Challenge, Lesson 3, Define e.g. on the problem tree what are the root causes (transportation issues, qualified teachers) and the "branches" (poor literacy, poor opportunities) to show interconnected issues.

Step 4: Ideate: Brainstorm different ideas for how your system could work. How would people use it? What kind of information would it provide?

Step 5: Refine your ideas. Focus on the most promising ones and think about how they could be even better or more accessible.

Support: Use the resources in MM7: Problem to Pitch Space Design Challenge, Lesson 4 and 5, Ideate

Step 6: Prototype: Create a model or sketch of your satellite system or app. This could include the type of information it provides, how people interact with it, and what it looks like.

Support: Use the resources in MM7: Problem to Pitch Space Design Challenge, Lesson 6 Prototype

Prototypes can be 3D or 2D if using wireframes for software / apps. You can read this article to help you https://www.figma.com/resource-library/what-is-wireframing/

Mock-ups can help you imagine how a user might interact with your satellite data -based app or system. Follow the steps in Canva to create a user Interface (UI) Mock-up for Satellite Solution

Steps in Canva:

1. Open a New Project:
   - Create a Custom Dimensions project, and set it to 1080x1920 pixels (this mimics a mobile screen format).
2. Set Up a Mobile Background:
   - In Elements, search for "mobile screen" to find a blank phone outline. Place it in the centre of the canvas.
3. Design the App's Home Screen:
   - Inside the mobile frame, add a rectangle for a menu bar at the bottom and a circle or square near the top for the main icon or app name.
   - Use text to title this screen as "Virtual Classroom" or "Assignments."
4. Add Buttons or Icons for Key Functions:
   - Create buttons or icons for each function, such as Quizzes, Videos or practice activities. Place each button within the phone screen as a tapable icon.
   - Label each icon clearly with small text beneath or beside it.
5. Add a Sample Data Preview:
   - Use a rectangle as a sample "data preview" section in the middle, where satellite data like "Recorded Classes, Books" would appear.
   - Use smaller text for this data to simulate a realistic UI (user interface) feel.
6. Enhance with Colours and Borders:
   - Add borders to each button/icon for a polished look, and apply a consistent colour theme (e.g., blue and white for a "tech" feel).
7. Review, Download, and Save:
   - Make sure everything is aligned neatly and easy to read.
   - Download the mock-up once it's polished!

You can also use cardboard - Cardboard Prototyping | Techniques, Cal Maritime Makerspace see https://www.youtube.com/watch?v=qxXj2RhKjZY

Or Paper Mobile Application Design: Paper Prototype Video, Cor-mac https://www.youtube.com/watch?v=y20E3qBmHpg

Step 7: Test: Share your prototype with others to get feedback. Use their suggestions to make improvements and ensure it's easy to understand and helpful for your users.

Support: Use the resources in MM7: Problem to Pitch Space Design Challenge, Lesson 7 Test