Praxis I Design Summary: Shoulder Straps

Helping EngScis keep a better back posture

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Opportunity

First-year EngSci students often struggle with poor back posture during long periods of sedentary study.

Actual sitting angle (bad)

Recommended sitting angle (100-110 degrees)

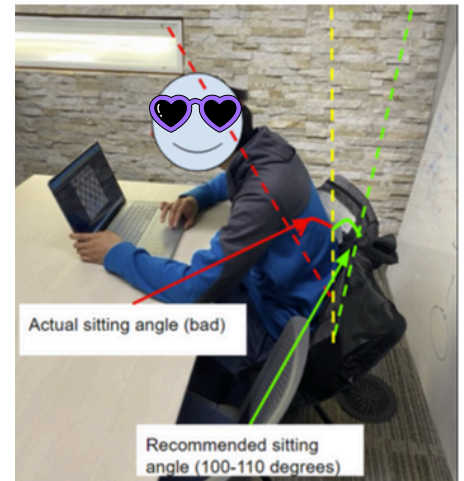## Designing For:

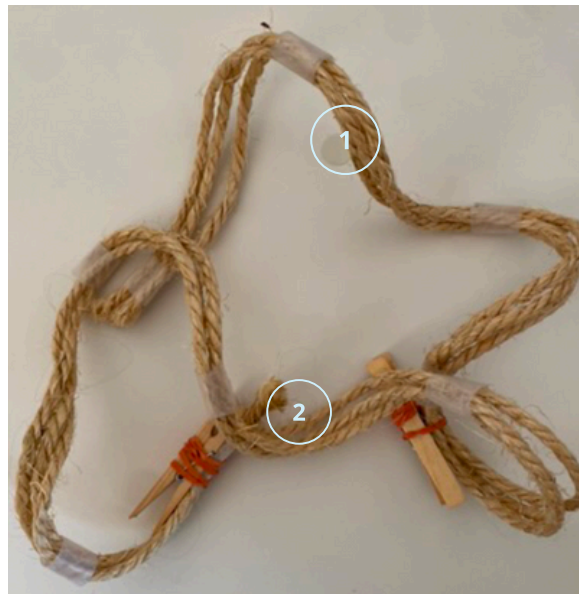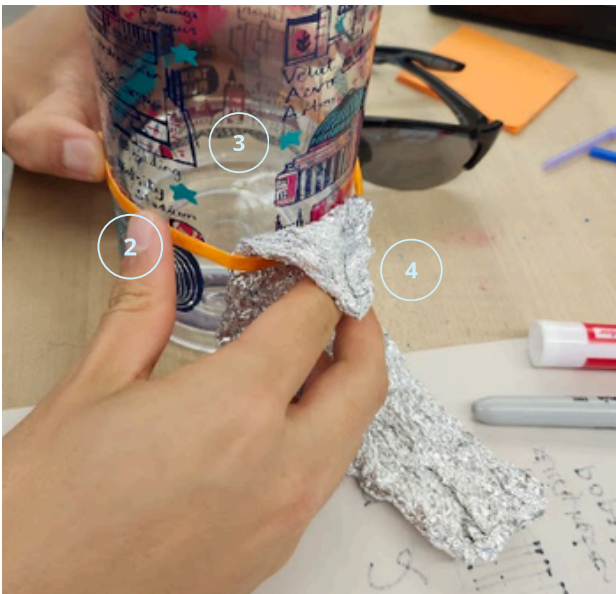Fixing back posture   Safety   Portability   Durability   Aesthetics

Our Proposed Design

Our design centers on an adjustable shoulder strap system designed to gently keep the user in an upright posture. The device integrates soft, wide shoulder straps and intuitive quick-release clips, ensuring both comfort and practicality.

1. Clips
2. Straps
3. Backrest
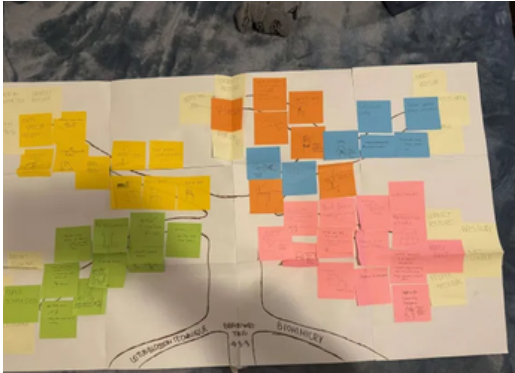4. User

Design Features

① Clips

The clips can be adjusted throughout the length of the rope and are for quick release.

② Straps

The straps have a larger surface area to increase the comfort of the user and reduce their back mobility.

CTMFs

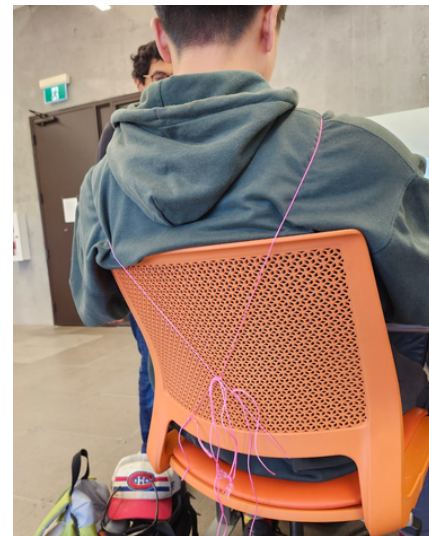*Diverging Tree Using the Biomimicry, Brainwriting 6-3-5, Random Input and Lotus Blossom Technique*

- *Pugh Chart:* Ranked designs against each other by comparing key requirements: safety, durability, comfort, portability, and aesthetics.
- *Brainwriting:* Used to quickly explore the design space.
- *Biomimicry:* Used to explore a broader design space by making connections to animals (i.e. giraffes).
- *Perry Model:* Combined and critiqued individual ideas to become an integrated authority.

Verification and Validation

- *Testing posture correction:* Wore each prototype to determine it's effectiveness in fixing back posture qualitatively
- *Testing for safety:* Used safety standards to inform safe design.
- *Testing for durability:* Dropped prototypes from 3 ft to test durability

Me wearing a very early prototype for the duration of a tutorial

Next steps

Further testing with higher fidelity prototypes is required to validate our design choices. As well, we would like to test with our stakeholders, and reframe our design and associated requirements from stakeholder feedback.