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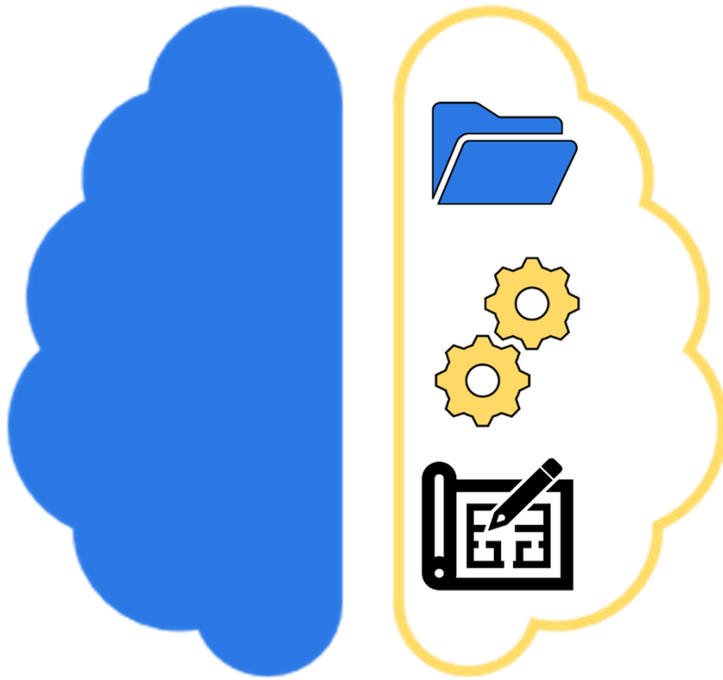


Designing Ụbụrụ: The Alpha Stage

Executive Function Rehabilitation Application for Mild Traumatic Brain Injury

Akuadasuo Ezenyilimba

Akuadasuo Ezenyilimba is a Human Systems Engineering PhD student at Arizona State University, and a National Science Foundation Research Trainee. Her academic background includes a Master of Science in Applied Psychology from Sacred Heart University, and a Master of Science in Human Systems Engineering from Arizona State University.

Her research interest include, traumatic brain injury rehabilitation, human computer interaction, and executive function.

Challenge

- 69 million traumatic brain injuries (TBI) occur each year
  - 70 – 90 % are classified as mild
- 25% of individuals with a mild TBI diagnoses report experiencing post concussive symptoms
- Only 30% of individuals with a mild TBI diagnoses report seeking next line care
- Only 2% of mild TBI individuals are given next line care referrals

Current Efforts

- Other Focuses: vision-based interventions
  - Oculomotor rehabilitation
- Only aspects of cognition
  - Do not feature EF specific training
- Studies primarily conducted at the military level, do not include civilians
  - Continue to perpetuate the general public's limited knowledge or awareness
- Current computerized interventions do not transfer skills learned in rehabilitation to activities of daily living that stem beyond motor skills, such as reading

Purpose

1

Further explore rehabilitation limitations facing the traumatic brain injury (mTBI) community

2

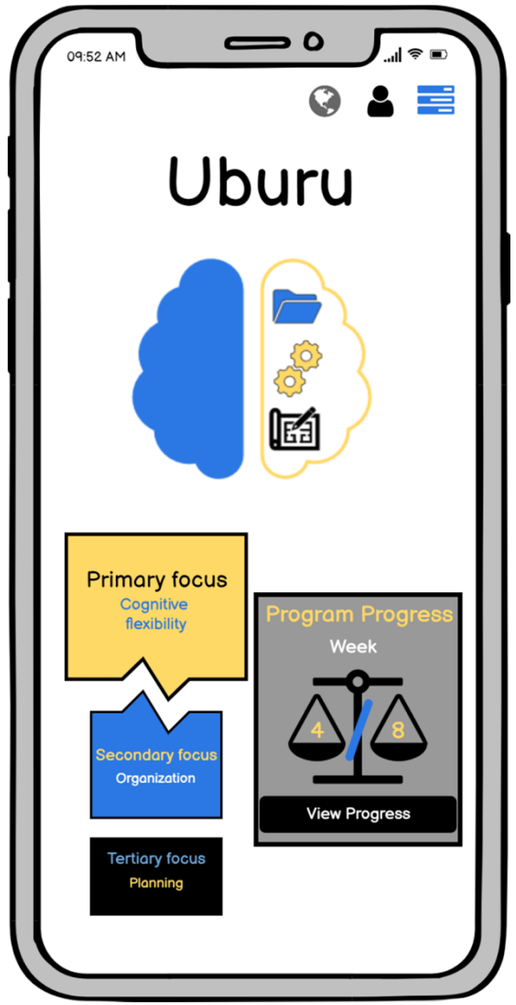
Address the needs of mild Traumatic Brain Injury (mTBI) individuals specifically, and

3

Explore a proposed intervention in its alpha stage

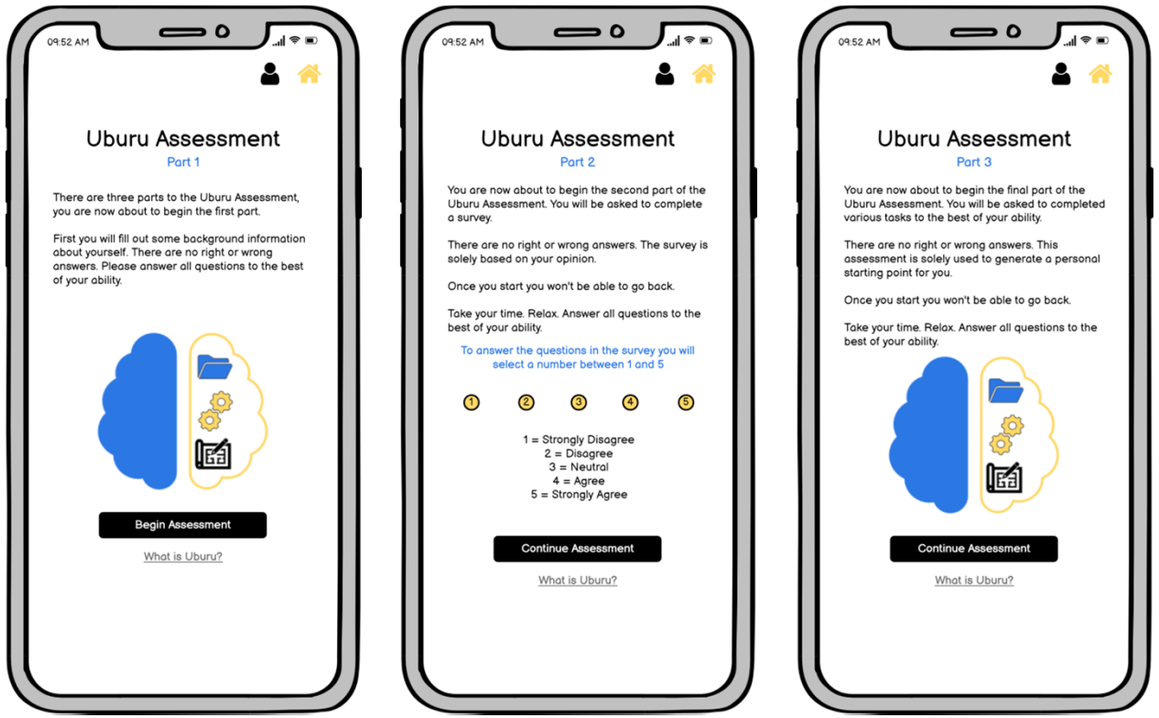
Application Focus

- Executive function focused
  - Cognitive Flexibility
  - Organization
  - Planning
  - Incorporates aspects of Working Memory
- Serious Games Approach
  - Computerized cognitive rehabilitation
  - Increase motivation
  - Increase participation
- Specifically designed for mild TBI individuals



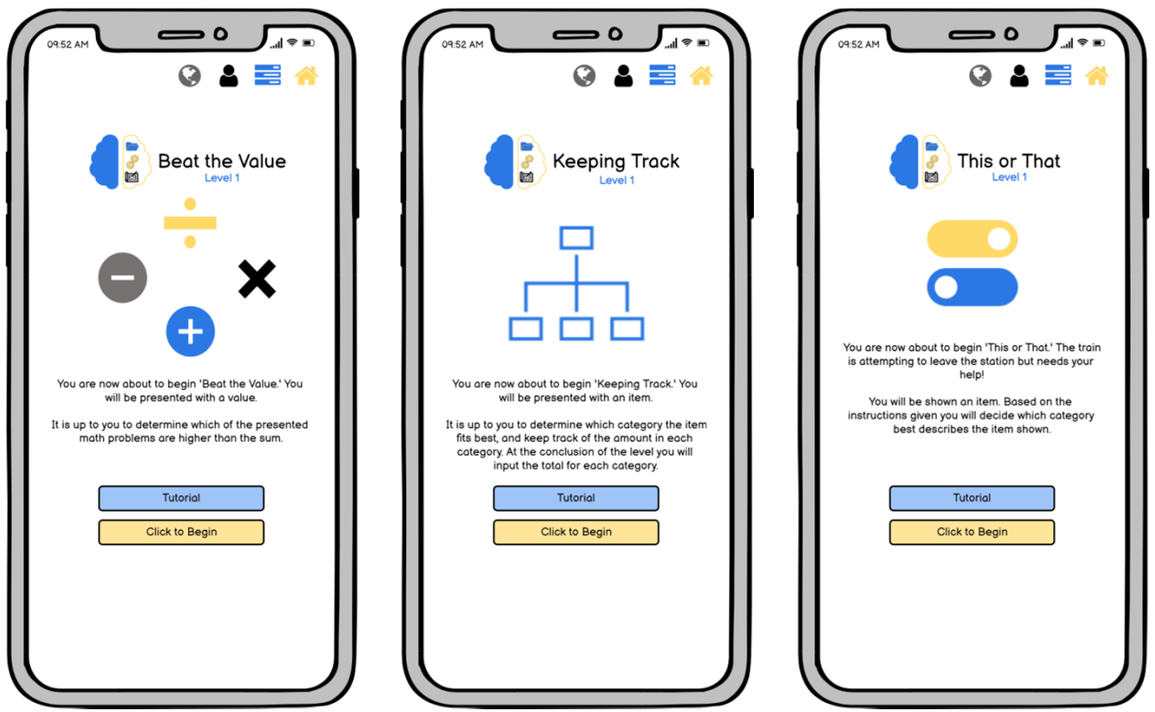
Application Components

Ụbụrụ Assessment



- Assess participants ability to:
  - Switch between tasks
  - Plan
  - Organize
- 3 Parts
  - Demographics Intake
  - Self-report Survey
  - Task based assessment
- Gives users a primary, secondary, and tertiary focus

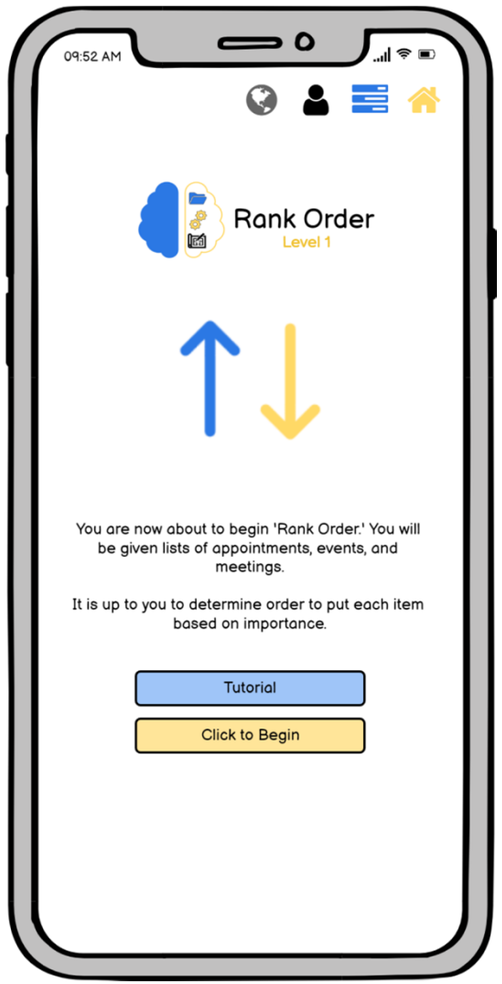
Cognitive Flexibility



- Games:
  - Beat the Value:
    - Problem Solving
  - Keeping Track (also incorporates aspects of planning and organization)
    - Maintaining and holding information
  - This or That
    - Task switching
- Focus:
  - Train task switching
  - Engaging working memory
  - Encourage users to adapt their thinking
- Aim:
  - Improve cognitive flexibility through, task switching, attention to detail, and maintenance of pertinent information to achieve a future goal

Organization

- Game:
  - Rank Order
    - Break down bigger events into smaller tasks
- Focus:
  - Overcome challenges with ineffective processing of information
  - Break down tasks
- Aim:
  - Improve organization skills related to:
    - Scheduling
    - Prioritizing and following logical steps
    - Coordinating activities.



Planning

- Game:
  - Train of Thoughts
    - Prioritization
- Focus:
  - Overcome challenges with engaging in activities that require planning ahead.
- Aim:
  - Plan in more time efficient manner
  - Minimize ineffective or poorly developed plans
  - Identify ways to overcome future conflicts

Key Principles

- **Awareness**
  - Overcome clouded perception due to new adaptations
  - Utilize self-report through weekly surveys

- **Visible Progress:**
  - Feedback
  - Recommendation through resources

- **Set Realistic Goals**
  - Assist in furthering awareness
    - *Everyone's baseline is different*

Objectives

- Encourage Individual Autonomy
- Rehabilitation additive
- Rehabilitation alternative when limitations are a factor (Time, Finances, Insurance, etc.)
- Specifically designed to train Executive Function
- Applicable to activities of daily living
- Mobile Friendly

Next Steps

Patent paperwork filed

Develop web-based

Begin piloting

Launch study

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