Development of a virtual home visit serious game for physiotherapy students to use when formulating a falls risk management plan for an older adult.

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Purpose

• Authentic Experience / Context
• Theory to Practice
• Millennial Learners (digital natives) – Cognitive Changes
• Make it easily accessible to students
• Minimum technological support
• Be able to be played on a mobile device
• Require minimum time to learn how to play the game
• Provide an immersive 3D experience
Serious Games

- Impossible
- Safety
- Cost
- Time
- Fail Safely
Outcomes – The 4 Stakeholders

**Learner** – Enjoyment, Confidence, Develop a Falls Risk Management Plan, Fail Safely

**Community** - More prepared staff, Improve falls management

**Decision Makers** - Innovate and Improve Learning

**Management** – Engaged Students, Logins, Scores, Comparison, Accessible, Low Technical Support
Audience

Active users: 147

- Male: 28%
- Female: 72%
Audience

Surveyed about their use of computer and mobile devices and gaming behavior

Males (n=17) more likely to play computer games

Males rate their computer skills higher in comparison to others of a similar age (n=15; 75%) than females (n=30; 60%)

Females spent longer playing than males

• Didn’t affect risks identified
Challenge

• Visit the home
• Assess the risk of falling
  • Identify visible risks
  • Identify Factors through conversation

• Scoring
  • 1 total score
• 4 Levels
• 3 attempts
Activities finished by students

1st attempt: 100%
2nd attempt: 40%
3rd attempt: 4%
• All Students Completed regardless of prior video games experience
• On average only took 14 minutes more
Average time spent on the game by student

1h 57min

2h 14min

1h 51min
Average time spent on the game by student:

- 1h 32min
- 1h 21min
- 1h 35min

Removing extremely high values from some students.
Time spent vs users
Number of sessions
Time spent vs time of day
Time spent vs score
(Min - Max)
• 70% of Game Time spent navigating, finding and identifying risk items
• 30% of Game Time spent in Conversations
HTML5

• No plugins
  • Flash, Unity3D, Java
  • Policies, Firewalls, User Installation Support
  • WebGL
    • Safari + Chrome
    • Later IE, FF, iOS, Android

• Desktop, Tablet, Smartphone and VR
  • University & Home
  • Optimization of Content for unknown devices
    • Mobile

• Tracking
• Moodle
• Login
• Course Activity - LTI
UX Interaction

• Virtual Guide
• Touch
  • Swipe
  • Arrow icons
• Mouse & Keyboard
  • Keyboard navigation – arrow keys
  • Click and Drag (Google Street View)
• VR
  • Gaze to look (Oculus) – Extra Tracking Software
  • HTML5 Device Orientation to look (Cardboard)
  • Mouse to click
UX Navigation

• Node based
• Guided
UX Feedback

- Knowledge Factor Indicator
- Risk Item Indicator
- Audio SFX
- Gateway Icons (Doors)
Conversations

• Branching Dialogue
• Uploadable
• Knowledge Factors
• Animations, Blinking, Gestures
• Text to Speech
  • No Lengthy Audio Production
  • Quick Changes
  • Future: Speech Recognition
• 30% of Game Time
• 8% Missed or didn’t complete a conversation
## Conversations

Average overall time spent on conversations **28min**

<table>
<thead>
<tr>
<th>Scene</th>
<th>Min. Time</th>
<th>Avg. Time</th>
<th>K. Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front House</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gina</td>
<td>3.1</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Front House</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walter</td>
<td>2.7</td>
<td>8.6</td>
<td>10</td>
</tr>
<tr>
<td>Downstairs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Violet</td>
<td>5.3</td>
<td>9.7</td>
<td>13</td>
</tr>
<tr>
<td>Upstairs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walter</td>
<td>1</td>
<td>1.3</td>
<td>0</td>
</tr>
<tr>
<td>Upstairs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Violet</td>
<td>2.48</td>
<td>2.49</td>
<td>11</td>
</tr>
<tr>
<td>Back House</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gina</td>
<td>2.6</td>
<td>1.95</td>
<td>5</td>
</tr>
</tbody>
</table>
Time spent on conversations
Knowledge Factors

92% of students found 100%
<table>
<thead>
<tr>
<th>Avg. Object Score</th>
<th>Object Found</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fenofibrate Pills 93%</td>
<td>Bottle of Alcohol 96%</td>
</tr>
<tr>
<td>Pizza Boxes 93%</td>
<td>Table Chairs 96%</td>
</tr>
<tr>
<td>Wall Mounted Phone 91%</td>
<td>Pizza Boxes 96%</td>
</tr>
<tr>
<td>Clotheslines 87%</td>
<td>Fenofibrate Pills 96%</td>
</tr>
<tr>
<td>Post Box 87%</td>
<td>Cabinet 94%</td>
</tr>
<tr>
<td>Sleeping Pills 84%</td>
<td>Cracked Driveway 94%</td>
</tr>
<tr>
<td>Sinemet Pills 83%</td>
<td>Step Stool 94%</td>
</tr>
<tr>
<td>Fire Hydrant 83%</td>
<td>Wall Mounted Phone 92%</td>
</tr>
<tr>
<td>Bottle of Alcohol 83%</td>
<td>Cracked Path 92%</td>
</tr>
<tr>
<td>Stacked Plates 82%</td>
<td>Fire Hydrant 92%</td>
</tr>
<tr>
<td>Trash Can 80%</td>
<td>Wooden Ladder 92%</td>
</tr>
<tr>
<td>Clothes 79%</td>
<td>Clotheslines 91%</td>
</tr>
<tr>
<td>Light Switches 79%</td>
<td>Long Dressing Gown 91%</td>
</tr>
<tr>
<td>Rake 79%</td>
<td>Boxes 91%</td>
</tr>
<tr>
<td>Fry Pan 78%</td>
<td>Swimming Pool 91%</td>
</tr>
<tr>
<td>Endep Pills 76%</td>
<td>Rake 91%</td>
</tr>
<tr>
<td>Rubbish Bin 75%</td>
<td>Trash Can 90%</td>
</tr>
<tr>
<td>Long Dressing Gown 73%</td>
<td>Post Box 90%</td>
</tr>
<tr>
<td>Microwave 73%</td>
<td>Weeds on the Footpath 90%</td>
</tr>
<tr>
<td>Garage Light 72%</td>
<td>Open Drawer 89%</td>
</tr>
<tr>
<td>Windows 72%</td>
<td>Wooden pallet 88%</td>
</tr>
<tr>
<td>Omeprazole Tablets 72%</td>
<td>Large Arm Chair 88%</td>
</tr>
</tbody>
</table>
Risk Items

77% of students found between 95% and 100%
• Goals of the project were all met
• Technology rose to meet strategic choices
• Uncanny valley
• Announcing Objects (Language Training Potential)
• Text to Speech (Accents)
• Mobile
• Changing VR landscape/SDKs
• Platform for scenarios by non-technical staff