Title: Design a Persuasive iPad game for children with Diabetes Type 1

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Candidate Participants: ?

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Abstract:

The aim of this project is to design Persuasive health game for iPad in order to improve self-monitoring and self-care practices of children (age 8-12) with type 1 diabetes. The Persuasive health game will explain to the users what diabetes is and why taking prescribed insulin, balanced diet (eat healthy), monitor blood sugar levels, regular physical activity and everyday diabetes management practices are important for their health outcomes. Persuasive Technology in healthcare known as behavioural modification technologies designed to educate users about their illnesses, changing user's attitude and behaviour to the illness, increasing users health and well-being.

Project objectives

Persuasive Technology (PT) in healthcare (known as behavioural modification technologies) refers to electronic or online tools designed to educate users about their illnesses. This can change user attitudes, and consequently their behaviours, towards a given illness which can increase user health. The aim of this project is to design a PT iPad game that encourages type 1 diabetic children (aged 8 - 12) to engage in self-monitoring and self-care practices. The game will help users to understand:

1. what diabetes is
2. why they should take prescribed insulin
3. why they should have a balanced diet
4. why they should monitor blood sugar levels
5. why they should engage in regular physical activity
6. why everyday diabetes management practices are important for their health outcomes

The focus of game development and design will be based on persuasive technology theory (also known as captology). This will involve the following four steps:

- **Understand everyday type 1 diabetes management for children.** This information will help to identify essential elements of the game concept, development and design the story, different characters and environments of the game, key features, dialogue and any other text in the game, game animations, user interface (designed for children as opposed to adults) , game rules etc.

- **Design and develop PT iPad game to help children combat chronic illnesses.** Specify Usability and User Interface requirements for child PT game using theories for child development and technology as well as theories for PT. Design low and medium fidelity Persuasive games.
- **Build low and medium fidelity Persuasive game prototypes.** Design and test low fidelity prototype of the game and then build medium fidelity prototype. This will involve writing the code that forms the structure of the game, animates characters, player inputs, etc.
- **Test and evaluate the game. This phase will test how effective is the game.** This phase will test how effective the game is. It will also test how applicable captology theory is for the design of an app game for children with chronic illnesses.

Background information: a brief review of the related literature, so as to let potential participants prepare themselves for the workshop

Self–management and self-care skills are important parts of treatment as they help patients to:

1) deal with the illness e.g. taking insulin, healthy diet, physical activities
2) maintain a healthy and productive lifestyle e.g. job performance, maintain relationships and fulfil social obligations, going to school, traveling
3) deal with emotions e.g. negative emotions related to the illness such as anger, depression as well as uncertainty about the future [7]

Children with diabetes are highly impacted by their behaviour. It influences their health outcomes and quality of life [5]. One way to encourage healthy behaviours and attitudes is by using captology or "computer(s) as persuasive technologies" [2]. PT or Captology is a computer technologies, device, or application designed to change a person's attitudes or behaviour. It has planned persuasive effects. Fogg describes a behaviour model for persuasive design [3], seven types of persuasion technique [2], six ethical issues [2] and eight steps design process [4] focused on early-stage of the design of effective persuasive technology.

As well as informative, PT in healthcare should also be user friendly. In the case of children, PT should have some element of entertainment in order to encourage target users to engage in the PT. One way to be entertaining is by incorporating some form of game in the design of a PT. Playing games can be enjoyable, fun and promote learning. They can also have positive impacts on children's behaviours and attitudes by motivating them to engage in healthy behaviours [6]. Serous health games main genres are: educational games, game to promote physical activity and persuasive games [1]. Brox et al [1] examine 'Escape from Diab', 'Escape from Obeez City' and 'Didget' persuasive games designed for children with diabetes.

Detailed technical description

The iPad is a tablet computer which runs on Apple's iOS operating system. The user interface incorporates a multi-touch screen (9.7 inches) which includes a virtual keyboard. It includes built in Wi-Fi and some models have cellular connectivity. As well as internet access, it also has video, photo and audio recording and playing capabilities. A number of other functions can be added by downloading and installing apps (application software designed for a specific purpose e.g. games and social networking).

    a) **Resources needed: facility, equipment, software, staff, etc.**

Equipment and software:

- Xcode (free)(Category: Developer Tools, Updated: Nov 01, 2012, Version: 4.5.2, Size: 1.50 GB) https://developer.apple.com/ipad/sdk/ or MIT App Inventor http://appinventor.mit.edu/
- Or iOS Developer University Program (it is a free program for students) https://developer.apple.com/programs/ios/university/
- iPad for testing and demonstration day
- Adobe® Creative Suite® 6 Design & Web Premium
- Each team member should have its own computer.
- MacBook Pro will be available for the programmer.

Game development team:

- a Persuasive Technology designer
- a Game designer (for the overall game concept),
- a Scriptwriter
- a Graphic Designer (work to develop environments, characters and objects in more detail)
- A GUI (Graphic User Interface) Designer (visual images, icon, written commands).
- a Programmer (Xcode or iOS)

b) Project management.

Each team member will contribute to meeting the research objectives and general planning process. Each participant from the team will have a clear task list with all tasks that are parallel with their expertise.

Work plan and implementation schedule:

WP1: Pre-workshop preparations: Identify Type 1 Diabetes Treatment Basics (results of my research in the area and cultural probes), discussion on examples of games, apps and persuasive technologies designed for children with type 1 diabetes, work on the design of the game: develop overall game concept (plan the story, characters, environments) of the game, key features, scriptwriting (the dialogue and any other text in the game), animations, user interface, rules etc. Preparation of the app framework and drivers.

WP2: Specify Usability and User Interface requirements for child persuasive game (Child Computer Interaction, Persuasive Technology theory). Design low and medium fidelity Persuasive games.

WP3: Build medium fidelity Persuasive app game;

WP4: Usability tests and evaluation of the game. Correct some errors and problems before demonstration day. Final report, presentation and demonstration.

- **A tentative timetable for the work to be done during the workshop;**

	Week 1	Week 2	Week 3	Week 4
WP1: Pre-workshop preparations. Develop overall game concept. App framework and drivers.				
WP2: Specify Usability and User Interface requirements. Design low and medium fidelity Persuasive games.				
WP3: Build medium-tech persuasive health app game.				
WP4: Usability tests and evaluation of the game. Final report and demonstration				
Presentations				

Benefits of the research

The research will produce:
- An indication of how appropriate captology theory is for the design of an app game that is tailored to the needs of children with chronic illnesses;
- A new form of Persuasive technology in the health-care domain;

- A medium fidelity prototype of a PT iPad game for children with type 1 diabetes;
- A game demo;
- A final project report;
- And a project presentation.

Profile of team:

Damyanka Tsvyatkova (UL) - Persuasive Technology Designer

More team members needed:

- a Game designer,
- a Scriptwriter
- a Graphic Designer
- a GUI Designer
- a Programmer

Team leader CV

Damyanka Tsvyatkova is a PhD candidate in Interaction Design Centre, University of Limerick (UL). She has a B.Sc. in "Digital Media Design", UL. For her FYP she designed a General Medical Support System (GMSS) which enables non-native speakers and medical professionals to overcome any language barriers they have.

She is multi-lingual and can speak fluent Russian, English and Bulgarian. She has also been a teaching assistant and has been worked at the Interaction Design Centre (IDC) at the University of Limerick. Her interests are in Human Computer Interaction (HCI), Children Computer Interaction (CCI), Information and Communication Technology (ICT), eHealth, Persuasive Technology (PT) and Captology. In August 2012 she was awarded with a three years full scholarship and her supervisor is Dr. Cristiano Storni who co-authored my proposal. The PhD project aims to design PT in healthcare in order to support children and adolescents with type 1 diabetes. Her approach is multidisciplinary and potential contributions are: assistive technology for type 1 diabetes children, reflection on the role of PT and on PD methodology in personal health. Her project is relevant for CCI, HCI end PT and the general area of e-Health.

References:

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