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Identifying existing, accessible touchscreen games for people living with dementia

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1 Background

A holistic approach to care can support people with dementia to live at home longer, as well as ensuring that the quality of life of those in receipt of care services are being maximised. Lack of activity, or boredom, is a problem reported for people with dementia both living at home and living in care services [1, 2]. Activities that are engaging can increase positive emotions and decrease boredom. Facilitating independent activity can be beneficial to avoid dependence on caregivers and to promote autonomy, and is possible at all stages of dementia progression, given the selection of appropriate activities.

Technology is increasingly being used in dementia care and there are many examples of touchscreen devices being incorporated into these interventions [3–5]. The majority of these devices are in the form of assistive technology, often where the person with dementia is not the intended user. There are limited examples of studies that have investigated using touchscreens directly with people with dementia for leisure or entertainment purposes, either using original software [6] or existing apps [7]. The benefit to using existing apps or software is that there is wide availability from the outset and any

potential risk of stigmatisation or exclusion through the design of population-specific technology is avoided.

An evaluation of existing touchscreen apps available in the Apple App Store was carried out with people living with dementia [8]. When offered a choice of ten different apps, a preference was indicated by the participants for activities that could be considered familiar. This notion was further explored in a recent study [9] where the choice element was removed and participants were asked to play either a familiar game or a novel game independently. Under these conditions, participants indicated an equally high level of enjoyment for both games, despite experiencing difficulties advancing through the familiar game. The conclusions drawn from this study were that people living with dementia are able to play touchscreen games independently, the selection of games does not necessarily need to rely solely on familiarity, and there is great potential in touchscreen gaming as an enjoyable activity.

The selection process for the two games in this study necessitated a systematic approach given the vast quantity of available apps for even the most specific game type. The purpose of the current paper is to describe this selection process and how it has evolved since its conception, with the overall aim of presenting a shareable framework that can be used to identify available touchscreen apps suitable for people living with dementia.

2 Framework

The selection process can be separated in to two stages; the first stage involves the identification of the *type* of app that is required; and the second stage involves the testing of an app or group of apps for suitability.

The first stage requires a specific idea of the sought-after app; the identification of the search terms; a decision as to how many apps are to be tested; and inclusion/exclusion criteria. The second stage of the framework involves testing the app or apps that are under consideration against a set of review criteria. This stage can be utilised in isolation of the first stage, depending on the context. The review criteria originally featured five categories: interaction method; feedback; content; visual design; and obstacles. Each item or category has an ideal definition as to what constitutes an accessible app for people living with dementia, based on an extensive literature review and from the previous work of one of the authors. After reviewing all of the apps under consideration, a decision can be made as to whether any are suitable for

3 Application

The framework has so far been used to identify five gaming apps, four of which have been tested and received positively by people living with dementia in studies in the UK and Canada. After the frameworks' use in each study, it has been adapted in response to the observed outcomes of applying the chosen apps with the target population. These adaptations have included the modification of existing categories, addition of further categories and the inclusion of a scoring system. In identifying the fifth app, four researchers applied the review criteria to the same twelve apps and a test of inter-rater reliability was applied to their scores, achieving conventional standards for reliability.

4 Conclusions

Evidence collected to date indicates that the app selection framework has the potential to be a reliable and valid method of identifying apps that can be recommended for people living

with dementia. Continued research will focus on the identification of more gaming apps with varied methods of user testing; an investigation of the usability of the framework by non-researchers (e.g. carers and clinicians); and the application of the framework to non-gaming apps.

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