

# *Comparing recent reviews about touchscreens for dementia with lessons from the field*

Book or Report Section

Accepted Version

Schikhof, Y., Goumans, M., Joddrell, P. and Astell, A. J.  
ORCID: <https://orcid.org/0000-0002-6822-9472> (2017)  
Comparing recent reviews about touchscreens for dementia  
with lessons from the field. In: Cudd, P. and de Witt, L. (eds.)  
Harnessing the Power of Technology to Improve Lives. Studies  
in Health Technology and Informatics, 242. IOS Press, pp. 1-4.  
ISBN 9781614997979 Available at  
<https://centaur.reading.ac.uk/75410/>

It is advisable to refer to the publisher's version if you intend to cite from the  
work. See [Guidance on citing](#).

Published version at: <http://dx.doi.org/10.3233/978-1-61499-798-6-1> "

Publisher: IOS Press

All outputs in CentAUR are protected by Intellectual Property Rights law,  
including copyright law. Copyright and IPR is retained by the creators or other  
copyright holders. Terms and conditions for use of this material are defined in  
the [End User Agreement](#).

[www.reading.ac.uk/centaur](http://www.reading.ac.uk/centaur)

**CentAUR**

Central Archive at the University of Reading

Reading's research outputs online

# Comparing recent reviews about touchscreens for dementia with lessons learnt from the field

## Quick Overview

Conclusions were synthesised from recent reviews on (touchscreen) technologies and people with dementia and lessons learnt using these devices in projects in the UK, the Netherlands and Canada. The combined findings provide a strong basis for defining new strategies for exploiting touchscreen technology for people with dementia.

## Introduction/Background

Two recent reviews respectively examined the general state of the art of assistive technologies for persons with dementia [1] and the specific application of touchscreens [2]. The former included the use of technology in ‘participating in pleasurable and meaningful activities’ (p2), considering usability and effectiveness among other things. The second review concentrated specifically on applications of touchscreen technology with people who have dementia, which they identified as falling broadly into three domains: assessment and screening; daily assistive and cognitive rehabilitation; and leisure activities [2]. The authors of both reviews also identified gaps for future research and development.

The findings of these two reviews confirm the emerging body of evidence demonstrating that people with dementia can use touchscreen technology for meaningful activities and entertainment [1-3], in line with the International Classification of Functioning, Disability and Health support for Activities and Participation [4]. This expansion was fuelled by the introduction of the Apple iPad in 2010, which opened up the field to explore how touchscreen technology can enable people with dementia to independently participate in leisure activities just as other app users do. In connected projects in the UK, the Netherlands and Canada, practice-based research was conducted to observe people with dementia, playing games on the iPad in a variety of settings; home, day care and long-term care. Alongside the primary research data, these studies revealed a lot about implementing touchscreen technology in the environments where people with dementia live. Here we compare these practical experiences and implications from the field, with findings from the reviews.

## Methods

The key messages relating to the use of touchscreens by people with dementia were extracted from the two reviews. These were supplemented by an additional review of articles about leisure activities with touchscreen technology [3-14]. A similar process of identifying key messages from the fieldwork was carried out. To consolidate the two sets of information the findings were compared (Table 1).

## Results and Discussion

### Evidence from literature review

Studies in the domain of leisure activities with touchscreen technology for persons with

dementia also report experiences from practice. We combine the findings from the general review of technology for dementia, [1] highlighting the suitability of touchscreen devices and describing two actions regarding the deployment of assistive technologies: **1. Information, education and training.** There is a need for clear information for persons with dementia, therapists and carers, about what already exists, for whom, and in what situations. They also need examples of how devices can be used effectively by persons with dementia to enable appropriate deployment. **2. Usability.** The usability of devices and applications by people with dementia should be considered before forms of technology are brought on the market or disseminated. In their review of specific deployment of touchscreens with people who have dementia [2] highlight three areas for further development. **3. Accessibility.** There is a need for improved accessibility features for people with dementia to gain most benefit from this technology. **4. Guidance on app selection.** Users need specific guidance on how to identify apps that might be suitable for people with dementia. **5. More activities.** Need to widen the scope of use of touchscreens to ensure maximum benefit to people with dementia. **6. Involving people with dementia.** Both reviews emphasised the importance of involving people with dementia in future developments and evaluation.

Table 1. Key findings about touchscreens for dementia from the literature and the field

Literature	Field
Information, education and training [1]	Tablet and cover
Usability [2]	Choice of games, apps, game selection
Accessibility [2]	App design
Guidance on app selection [2]	(informal) Support and prompts
Greater range of activities [2]	Acceptance by caregivers
Involving people with dementia [1,2]	Stimulation of social interaction

### Evidence from the field

**1. Tablet and cover.** The first point from the field is consideration of the suitable placement of the tablet (touchscreen) and ability to raise it to a comfortable level [5,9,11]. A tablet is thin and uneasy to hold and buttons can be also touched unintentionally. A specially designed cover/stand for the device helps people with dementia use the tablet comfortably. This will also appeal to the urge of people with dementia to hold something. Tablet covers with grips [11] or comfortable, soft edges, appeal to their needs and hide crucial buttons at the same time. **2. App selection.** Regarding selection, more choice and more applications are needed that are suitable for people with dementia. People with a diagnosis, therapists and carers, need information about the choices available and how to identify them. This can include digital versions of familiar games (e.g. chess or ‘Sjoelen’) but can also include novel digital activities, for instance tile matching games [13]. After making a list with the most successful apps, further experimental validation of the benefits is warranted. **3. App design.** More dedicated apps should be developed that consider the specific limitations in speed of processing, memory, and attention skills of people with dementia [8]. Combining current and future digital functionality and hardware with understanding of the cognitive profiles of different dementia subtypes, will open up many opportunities [7]. Not only identifying more suitable apps is needed, but also information about the characteristics of the activity, needed skills, and the effect on persons with dementia. Information should be easily accessible to enable deployment. The list of apps, with additional information, should be available through popular websites concerning dementia. Effective design features should also be shared with app developers.

**4. Informal support.** Lessons from the field also identified that informal support for using the device from family members is highly valued [5]. In nursing homes the support of grandchildren or other visitors, influences the use of the device positively. To aid this further research on what types of prompts are effective [9,14]. The response to prompts also differs per individual, again warranting more investigation. **5. Acceptance by caregivers.** Another important aspect of successful deployment is acceptance by caregivers. This can be stimulated by features enabling communication, social networking and reminder systems [5]. Accessibility [2] is easier when a device is used more in daily practice. In day care the use of the iPad was for instance more easily accepted when caregivers could also use it for other activities, such as translation of words to or from the original mother language of persons with dementia. **6. Social interaction.** Finally, experience in the field revealed that sharing experiences or some other form of external motivation can stimulate people to engage more [10-11]. Apps can provoke conversations and become a favourable shared activity [5-6,12]. Stimulation and social interaction is a key success factor.

### **Future directions**

In this comparison of recent reviews and lessons learnt from the field we found overlaps in the highlights for successful deployment of touchscreens, app selection and development. This analysis also highlighted practical issues relating to actual use in the field (Table 1). Both review articles [1-2] mentioned the need for dissemination of what is already known about the use of available apps and devices for persons with dementia, to enable deployment in practice. Both the literature and practice from the field, identified the need for ongoing research to identify successful apps and their benefits, as well as highlighting the need for involving people with dementia in development and evaluation.

Combining all the currently available knowledge is an important task. The limitations of the two mentioned reviews and the ever-growing app market for games, make this a huge research theme. However, the lessons exchanged by researchers in several connected projects, extend the findings of the identified studies. Specifically in relation to the practicalities of all aspects setting up and deploying touchscreen in the field with people with dementia. The challenge is to inform intended users in a constructive way and provide them with a wide range of apps. Which activity is suitable for an individual person with dementia, will always be a result of showing and trying. The barriers for doing this, should be lowered. Based on these reviews and the lessons learnt from the already co-operating researchers, new strategies can be discussed.

### **Conclusions**

Combining findings from literature with lessons learnt from the field, provides both depth and breadth for helping other researchers and developers into the field. The results will also help professional or informal caregivers to select apps by pre-selection, and is an important first step in co-operation.

### **References**

1. Meiland, F., Innes, A., Mountain, G., Robinson, L., van der Roest, H., García-Casal, J. A., ... & Kelly, F. (2017). Technologies to support community-dwelling persons with dementia: a position paper on issues regarding development, usability, effectiveness and cost-effectiveness, deployment, and ethics. *JMIR Rehabilitation and Assistive Technologies*, 4(1), e1.

2. 2. Jodrell, P., & Astell, A. J. (2016). Studies involving people with dementia and touchscreen technology: a literature review. *JMIR Rehabilitation and Assistive Technologies*, 3(2), e10.
3. 3. Smith, S.K. & Mountain, G.A. (2012). New forms of information and communication technology (ICT) and the potential to facilitate social and leisure activity for people living with dementia. *International Journal of Computers in Healthcare*, 1(4), 332-345.
4. 4. WHO (2001), *International Classification of Functioning, Disability and Health*. Geneva: WHO library.
5. 5. Lim, F. S., Wallace, T., Luszcz, M. A., & Reynolds, K. J. (2012). Usability of tablet computers by people with early-stage dementia. *Gerontology*, 59(2), 174-182.
6. 6. Topo, P., Mäki, O., Saarikalle, K., Clarke, N., Begley, E., Cahill, S., ... & Gilliard, J. (2004). Assessment of a music-based multimedia program for people with dementia. *Dementia*, 3(3), 331-350.
7. 7. Astell, A. J., Malone, B., Williams, G., Hwang, F., & Ellis, M. P. (2014). Leveraging everyday technology for people living with dementia: a case study. *Journal of Assistive Technologies*, 8(4), 164-176.
8. 8. Kong, A. P. H. (2015). Conducting cognitive exercises for early dementia with the use of apps on iPads. *Communication Disorders Quarterly*, 36(2), 102-106.
9. 9. Leuty, V., Boger, J., Young, L., Hoey, J., & Mihailidis, A. (2013). Engaging older adults with dementia in creative occupations using artificially intelligent assistive technology. *Assistive Technology*, 25(2), 72-79.
10. 10. Manera, V., Petit, P. D., Derreumaux, A., Orvieto, I., Romagnoli, M., Lyttle, G., ... & Robert, P. H. (2015). 'Kitchen and cooking,' a serious game for mild cognitive impairment and Alzheimer's disease: a pilot study. *Frontiers in Aging Neuroscience*, 24(7), 78-87.
11. 11. Yamagata, C., Coppola, J. F., Kowtko, M., & Joyce, S. (2013, May). Mobile app development and usability research to help dementia and Alzheimer patients. In *Systems, Applications and Technology Conference (LISAT), 2013 IEEE Long Island* (pp. 1-6). IEEE.
12. 12. Tyack, C., Camic, P. M., Heron, M. J., & Hulbert, S. (2015). Viewing Art on a Tablet Computer A Well-Being Intervention for People With Dementia and Their Caregivers. *Journal of applied gerontology*, 0733464815617287.
13. 13. Astell, A.J., Jodrell,P., Groenewoud, H., de Lange, J., Goumans, M., Cordia, A. & Schikhof, Y. (2016). Does familiarity affect the enjoyment of touchscreen games for people with dementia?. *International journal of medical informatics*, 91, e1-e8.
14. 14. Astell, A.J., Alm, N., Dye, R., Gowans, G.M., Vaughan, P. & Ellis, M. (2014, July). In *International Conference on Computers for*

*Handicapped Persons* (pp.264-271). Springer International Publishing.