

*E.J.M. WOUTERS (Convener) Participatory design for (and with) persons with dementia. Gerontechnology 2014;13(2):159; doi:10.4017/gt.2014.13.02.041.00* **Participants** S.T.M. Peek (Netherlands), J. van Hoof (Netherlands), Y. Schikhof (Netherlands), E.L.M. Zwerts-Verhelst (Netherlands) **Issue** Designing solutions for the various issues that are faced by people with dementia requires that specific needs be met. Several stakeholders can be identified in this design process, both as designers and as potential end users. Successful design and implementation depend on fulfilling the needs of these stakeholders. Participatory design is one of the strategies employed to meet the needs, as the design process involves the end users at an early stage and gives them the means to influence the potential outcomes. The REAFF-framework<sup>1</sup> can also be used to address the needs of people with dementia in the first stages of the process. **Content** In this session, we will provide examples of design for and with persons who have dementia. The examples presented will cover the following themes: acceptance of technology by older persons, design of the nursing home of the future, designing happy games (apps) for people with dementia, and gardens for persons with dementia and their caregivers. We will use cases from practice in the Netherlands to illustrate the process by which design can be executed for and with people who have dementia. **Structure** There will be four oral presentations followed by a panel discussion. **Conclusion** People with dementia can indeed play a role in the design process, as the cases presented will show.

### References

1. Astell A. REAFF- A framework for developing technology to address the needs of people with dementia. CEUR Workshop Proceedings of 1<sup>st</sup> International Workshop on Reminiscence Systems 2009; pp 5-10

**Keywords:** dementia, design, user involvement

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*S.T.M. PEEK, S. AARTS, E.J.M. WOUTERS. Field research on cognitive decline and the use of technology by older adults. Gerontechnology 2014; 13(2):159-160; doi:10.4017/gt.2014.13.02.165.00* **Purpose** Although aging in place is preferred by most older adults and policy makers, there are situations in which aging in place can be challenging. This is particularly true in the case of cognitive decline, which has a profound influence on all aspects of life, including the use of technology<sup>1,2</sup>. Technology may compensate for some consequences of cognitive decline. However, field research on the relationship between cognitive decline and technology is scarce. In an upcoming study entitled “Technology use while facing cognitive decline”, participants with a MMSE score of 24 or lower and a proxy will be interviewed regarding (i) difficulties in the everyday use of technology, and (ii) compensatory technologies for managing cognitive decline. **Method** In our current longitudinal mixed-methods field study (Ageing all right, with technology by your side), house visits have been – and continue to be – conducted every six to eight months on four occasions from 2012-2015. During each house visit: (i) chronic diseases, major life events, frailty, cognitive functioning, and quality of life are assessed; (ii) an inventory is drawn up of the use of all low-tech and high tech electronic appliances capable of supporting aging in place; and, (iii) participants are interviewed regarding their reasons for acquiring technology and changes or stability in use. Initially, at baseline (t1), participants of this study were at least 70 years old, and were required to have an MMSE score of at least 25. However, at the next occasion, eight months later (t2), some of these participants showed an MMSE score of 24 or lower. These participants, and participants that will score 24 or lower at t3 and t4, will be invited to participate in the “Technology use while facing cognitive decline” study. **Results & Discussion** For the current longitudinal study, house visits have already been conducted in November 2012 (t1, n=53) and June 2013 (t2, n=37). *Table 1* shows the distribution of MMSE scores of participants at t1 and t2 in the current study. In the “Technology use while facing cognitive decline” study, our aim is to build a number of case-studies of participants, who, in the current longitudinal study, show an MMSE score of 24 or lower. Qualitative analysis (i.e. interviews) of factors influencing technology use will reveal a range of individual, technological, and contextual factors related to technology use in people

with cognitive problems. At the congress, the methodology of the study will be outlined and preliminary findings will be presented.

### References

1. Rogers WA, Fisk AD. The Journals of Gerontology Series B Psychological Sciences and Social Sciences 2010;65B(6):645–653; doi:10.1093/geronb/gbq065
2. Tun PA, Lachman ME. Psychology and Aging 2010;25(3):560-568; doi:10.1037/a0019543

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**J. VAN HOOF. Design of nursing homes of the future. Gerontechnology 2014;13(2):160;** doi:10.4017/gt.2014.13.02.210.00 **Purpose** There is an increasing call in society for improvement of the well-being of nursing home residents and support of health care professionals through a wide array of architectural and technological solutions that are available in modern nursing homes. The design of nursing home facilities calls for new approaches that are designed to maximise the needs of the stakeholders<sup>1,2</sup>. The purpose of this study is to investigate (i) the current state of the art in technological and architectural solutions, including changes and features desired by professionals working in the domain of nursing home patient care as well as by those working with nursing home construction and technology, and (ii) the desires of nursing home residents concerning the home environment through multiple sessions with stakeholders and residents. The implicit goal of this investigation was to gather the insights and visions of all stakeholders in the field to determine the best practices for nursing home care and design, which, in turn, can be used for the design of a nursing home demonstration centre. **Method** Various methods allow the identification of stakeholder needs and the incorporation of those needs into a design, including co-creation sessions and focus groups<sup>3,4</sup>. An interactive, qualitative study design was chosen. Ten single disciplinary focus group sessions (with 95 professionals from various stakeholder groups), 22 interdisciplinary mind map sessions (with 97 professionals), 12 interdisciplinary prototyping sessions (with 56 professionals), and individual interviews (with 10 residents) were conducted from May to October 2013.

**Results & Discussion** This study yielded extensive lists of themes and subthemes related to solutions and design guidelines that were considered essential by stakeholders from healthcare and technology fields, as well as from the residents. These domains should be used when designing new nursing homes because they represent the needs of Dutch stakeholder.

### References

1. Hoof J van, Verkerk MJ. Technology in Society 2013;35(1):1-13; doi:10.1016/j.techsoc.2012.11.002
2. Hoof J van. Ageing-in-place: the integrated design of housing facilities for people with dementia. Dissertation. Eindhoven University of Technology; 2010; p 279
3. Hoof J van, Wetzels MH, Dooremalen AMC, Wouters EJM, Nieboer ME, Sponselee AAM, Eyck AME, Gorkom P.J.M van, Zwerts-Verhelst ELM, Peek STM, Vissers-Luijckx C, Voort CS van der, Moonen MJGA, Vrande HA van de, Dijck-Heinen CJML van, Raijmakers TE, Oude Weernink CE, Paricharak N, Hoedemakers CGJJ3, Woudstra JMM, Voort L van der, Werff TCF van de, Putten B van der, Overdiep RA. Technology in Society 2014;36(February):1-12; doi:10.1016/j.techsoc.2013.12.001
4. Hoof J van, Blom MM, Post HNA, Bastein WL. Journal of Housing for the Elderly 2013;27(3):299-332; doi:10.1080/02763893.2013.813424

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**Y. SCHIKHOF, J.H. GROENEWOUD, A.L. CORDIA, J. DE LANGE. Designing happy games (apps) for people with dementia. Gerontechnology 2014; 13(2):160-161;** doi:10.4017/gt.2014.13.02.106.00 **Purpose** Within the project 'In Touch'; touch screen application for people with dementia, a concept happy game was designed for the iPad. The purpose of this happy game is

*Table 1. Distribution of MMSE (Mini Mental State Examination) scores at t1 and t2*

MMSE	t1 (n=53)		t2 (n=37)	
	n	%	n	%
≤ 23	-	-	2	5
24 – 26	11	21	5	14
27 – 30	42	79	30	81
Mean±SD	27.8±1.7		28.1±2.3	

to provide a meaningful individual activity for persons with dementia, to give pleasure, and to create a sense of self-achievement. **Method** A Bachelor student of Communication and Multimedia Design<sup>1</sup> started with a literature review about the quality of life of people with dementia, which provided insights for the design process. As technology should address the needs of people with dementia, the REAFF-framework<sup>2</sup> was used in the design process as well. This framework contains four principles to guide the development of technological solutions: Responding; Enabling; Augmenting; and Failure-Free. Based on these principles, literature reviews, and former practical research, a number of requirements were formulated, including technical requirements, design requirements and functionalities of the concept game. The student visited a day care center and nursing home for people with dementia and observed patients with moderate or mid-stage Alzheimer's disease. To acquaint herself with their behavior, she sat with them and had short conversations about photographs and about things they liked to do. With some patients, she played with commercially available apps on the iPad or did other simple activities, like coloring a picture together. These activities contributed to her understanding of people with dementia, according to the first step of the Extended User Design Circle: Understand<sup>3</sup>. Before we begin to design an app to help dementia patients, it is important to understand its intended users. Based on the student's observations and the results of an earlier study that explored the interests of people with dementia, the student chose the subject 'pets' for the game concept. In the next step, she tested a style of the picture game with fifteen patients with dementia. Patients preferred realistic pictures, especially photographs, over simple pictures or cartoons. This enabled us to design game graphics. The student made her expectations of how a happy game with a dog could be played, explicit and tested these expectations in a prototype version with twelve patients. This included touching buttons and/or objects on the screen, what stimuli might encourage the patient to touch the screen, what actions of the dog were preferred, if other pets (cat and bird) evoked similar reactions and the actual playing. The prototype was only tested once with each person. **Results & Discussion** A prototype of this game was played by nine patients with dementia, seven of whom reported enjoying the game. Three other patients had only looked at the game; two of them seemed happy watching the game being demonstrated. From the test results, a more precise set of requirements was formulated for further development of the app. Looking back at the REAFF-framework, this game responds to people's desire to take care of something; it enables people with dementia to act independently; it provides augmented reality; and the player cannot fail the game. Understanding the special needs, preferences, and abilities of people with dementia by spending time with them throughout the design process, including testing design choices, has proven successful.

### References

1. Zeeuw W de. [How could a game improve quality of life of adults with dementia?] (in Dutch). Bachelor Thesis Rotterdam University of Applied Sciences 2013.
2. Astell A. REAFF- A framework for developing technology to address the needs of people with dementia. CEUR Workshop Proceedings of 1<sup>st</sup> International Workshop on Reminiscence Systems 2009; pp 5-10
3. Harper R, Rodden T, Rogers Y, Sellen A, editors. Being Human: Human Computer Interaction in the Year 2020. Cambridge: Microsoft Research; 2008

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*E.L.M. ZWERTS-VERHELST, J. VAN HOOFF, E. WOUTERS. Don't forget about the garden! The design of gardens for people with dementia. Gerontechnology 2014; 13(2):161-162; doi:10.4017/gt.2014. 13.02.179.00 Purpose* When designing a nursing home, architects and planners need to consider ways to provide patients and caregivers with a feeling of a natural setting and being a part of the outdoor world as well as considering themes such as having accessible gardens that take the total well-being of its residents<sup>1</sup>. A substantial mountain of evidence suggests that participating in green and gardening activities for people with dementia provides a positive response in such patients<sup>2-5</sup>. Experiencing the natural world and relaxing in fresh air and daylight are considered beneficial to well-being and health. The limitations of

people with dementia often mean they are dependent on the people around them to provide them with opportunities to access a green environment as described above. This study focuses on the essential design needed for gardens to be enjoyed by people with dementia as part of an enriched living environment. **Method** First, literature and studies providing evidence of the beneficial effect of gardening and gardens on persons with dementia were reviewed. The analysis focused on (i) the accessibility of nursing home gardens, (ii) ways we can entice people with dementia to go into the garden (independently), and (iii) ways we can motivate these people to want to stay in the garden, once they enter it. **Results & Discussion** A green area offers nursing home patients, their families and caregivers many opportunities to socialize, to reminisce and to regain an increased sense of autonomy. Therefore, encouraging people with dementia to stay in a green area more often and to participate in gardening and other activities is desirable. Caregivers can also benefit from the positive effects, such as improvements in mood and stress levels. Only limited evidence is available based on the effects of green environments on the quality of life of people with dementia, because of research limitations, small samples sizes and a lack of appropriate measurement instruments, as well as the researcher's inability to specify and define factors influencing the results, etc. Qualitative research data provide the initial guidelines for providing increased attention to the design of garden spaces and related activities. Despite the positive aspects of a garden, many Dutch nursing homes have gardens that suffer from poor accessibility. We also find that people with dementia often want to go back inside a nursing home once they enter an outdoor environment.

**References**

1. Hoof J van, Wetzels MH, Dooremalen AMC. *Technology in Society* 2014;36(1):1-12; doi:10.1016/j.techsoc.2013.12.001
2. Hernandez RO. *Journal of Housing for the Elderly* 2007;21(1-2):117-152; doi:10.1300/J081v21n01\_07
3. Gibson G, Chalfont GE, Clarke PD, Torrington JM, Sixsmith AJ. *Journal of Housing for the Elderly* 2007;21(1-2):55-72; doi:10.1300/J081v21n01\_04
4. Chalfont G. The Dementia Care Garden: Part of daily life and activity. *Journal of Dementia Care* 2007;15(6):24-28
5. Chalfont G. The Dementia Care Garden: Innovation in design and practice. *Journal of Dementia Care* 2008;16(1):18-20

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