



Babbelbord: A Personalized Conversational Game for People with Dementia

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Abstract. We present a demonstration of the board game named “Babbelbord” that stimulates narrative reminiscence in a novel interactive, personalized and entertaining way for people with dementia. Narrative reminiscence is part of reminiscence therapy which is often used in dementia care as it reduces neuropsychiatric symptoms, and therefore improves the quality of life for people with dementia. Stimulating narrative reminiscence entails communicating personal memories with others without intent or evaluation. The Babbelbord game is a newly developed board game that was based on an old-fashioned game that is familiar to people with dementia. The purpose of the Babbelbord game is to reconnect older adults with dementia to their relatives and friends by stimulating narrative reminiscence with a personalized game question approach. The Babbelbord game provides interactive and entertaining conversation starters in a gamified way between people with dementia and their relatives. In this paper, we describe and demonstrate how the Babbelbord was designed to offer an engaging and gamified user experience, tailored for older adults affected by dementia.

Keywords: Dementia · Older adults · Narrative reminiscence · Serious game

1 Introduction

Dementia is a neurodegenerative disease that affects cognitive functions [1] and that can lead to an increase of neuropsychiatric symptoms such as frustration, aggressiveness, anxiety, agitation, apathy and/or delusions in people with dementia (PWD) [1]. A method to reduce these symptoms are by conducting reminiscence therapy (RT). Using reminiscence or life review therapy can have a positive impact on cognition, mood, and behavior of PWD [1]. RT involves the conversation of past activities, events and experiences with another person or group of people, usually with the support of tangible cues such as photographs, familiar items from the past, music and sound recordings [1]. Narrative reminiscence (communicating personal memories in an interactional context with no evaluative or instructive intent [2] frequently sets up or magnifies positive emotions [3]. Using technology that offers many benefits, we aim to

stimulate personalized narrative reminiscence with PWD. By combining the technology of SoftWare-based Assistive Technologies (SWAT), serious games and narrative reminiscence therapy, a technology driven gamified game can be developed that encourage reminiscence about the past to offer an engaging user experience [4], tailored for people with Dementia, which in turn will stimulate conversations and thereby improving quality of life.

2 Development of the Game

As the aim was to develop a personalized, technology driven game to stimulate conversations by presenting topics and questions from the past, we combined technology to personalize the game and traditional board games. Multiple iterations were conducted to design the technology driven board game.

2.1 Design of the Board Game

From the interviews with an activity expert in dementia care, caretakers and relatives of a person with dementia, we found that the board game had to be familiar and simple in terms of interaction and motor skills. Based on these interviews, we designed a board game named “Babbelbord” which is based on a popular traditional board game named “Game of the Goose”. We created pawns that represent the players, a colored dice that matches the squares on the board where the pawns are placed when rolling the dice. Babbelbord is played in a similar way as the “Game of the Goose” is played. Babbelbord can be perceived as familiar, and therefore, simpler to understand especially for PWD who has played lots of board games in their past. In addition, we included a personalization layer in the Babbelbord, by using technology in forms of an arduino and a tablet. This personalization layer includes three separate functionalities: (1) We can display the conversation topics and its game questions to stimulate narrative reminiscence on the tablet, (2) the possibility to filter out conversation topics prior to starting the game, and (3) skip game questions during gameplay. The personalization layer functions as the added value of using technology, by avoiding topics and game questions that triggers negative associations and memories in PWD. Figure 1 shows the finished prototype of the Babbelbord board game.



Fig. 1. Left: The Babbelbord game. Right: A question in the Babbelbord web application shown on the tablet.

2.2 Constructing the Conversation Questions

The developed game questions were based on the book “Dierbare herinneringen” [5]. The book gives examples of well formulated questions about recalling previous memories of different phases in life (i.e., childhood), especially for PWD. Based on findings in the interviews that also focused on the comprehensibility of the questions, we found that game questions have to be formulated in a simple, more closed-ended way to reduce confusion in PWD and makes it for them easier to answer the questions. Although closed questions are less efficient to recall a memory, a balance of closed and open-ended main questions that were further divided into sub-questions were constructed and implemented for the board game. First, closed game questions are asked that are easy to understand and guides the PWD step by step towards the main open question, thereby providing the context of the main question. In addition, giving an indication of time when talking about the past (i.e., childhood or teenage years) is important as it should be clear to the PWD that childhood refers to 0–12 years old and that teenage years refers to 12–18 years old. Lastly, it was suggested in the interviews that providing context for game questions is as important as the question itself. In other words, the PWD should be slowly introduced and guided through a series of easy understandable steps, to eventually understand the situation as a whole. An example of a game question of the category “Love” is shown in Fig. 1.

2.3 Gamified Experience

To introduce a gamified experience to the Babbelbord game, special colored squares have been added that contain various actions, such as making the other player skip their turn. These special squares are inspired by “The Goose Game”. In addition, another game element that was added are special colored cards that the players have to collect in order to win. The color on the cards matches to one of the categories, so when players answer a category question, they also receive the corresponding colored card. Each colored card also has the same special power: when a player has two cards of the same color, he/she can decide to discard these cards to obligate the other player to discard their card of the same color.

3 Evaluation of the Babbelbord Game

To evaluate the user experience of the Babbelbord game, two user studies were conducted. The first user study consisted of caregivers and an activity expert at a Dutch care home. The second user study consisted of six older adults with mild-moderate dementia with their relatives or a volunteer at a Dutch care home. In both user studies, a semi-structured interview was carried out with the caregivers, activity experts and relatives at the end of the gameplay. The study was approved by the Ethics Committee of the University of Twente. Prior to the user studies, participants signed the informed consent.

3.1 1st User Study with Caregivers and Expert

The Babbelbord game received positive feedback from the activity expert and caregivers. The activity expert stated that the board game evokes conversation in a gamified way, where the players are potentially entertained and motivated. The activity expert indicated that the competitive game mechanic of the colored cards might be too difficult for people with moderate dementia. He suggested a possibility to implement different versions of the game, including and excluding the new game mechanic. The current game can be played by people with early-mild dementia, and the game without the game mechanic of colored cards can be played by people with moderate dementia. Both the caregiver and activity manager agreed that the personalization layer adds value to the player. According to both, when having a conversation with a person with dementia and a negative memory is triggered, they might get frustrated and will not be able to communicate any further. It is therefore essential not to raise any topics with a heavy negative emotional load. With the topic selection, one is able to filter out topics prior to playing the game. This is particularly essential when the topic also has an emotional effect on the caregiver/relative. Moreover, by giving feedback about the appropriateness of the questions, the system can remember what questions not to ask the next time.

3.2 2nd User Study with PWD

To evaluate the user experience of PWD, a 2nd user study was conducted with six older adults with mild-moderate dementia and their relatives or a volunteer at a Dutch carehome where PWD and a volunteer/relative engaged in conversations with and without the hi-fi prototype of Babbelbord. Two experimenters made observations about the perceived engagement and carried out thematic analyses on the semi-structured interviews that were held with the volunteers/relatives. Observations showed that all subjects involved gave more responses and were more enthusiastic when the Babbelbord was used. The semi-structured interviews showed that the Babbelbord could support most of the PWD in recalling memories and engaging in conversations. Some mentioned better attention levels with the Babbelbord, and improved listening and conversational abilities. However, it was also mentioned that some PWD were confused by the way the questions were formulated (they did not understand the questions), the unclear rules of the game (it was sometimes not clear whose turn it was), and that some PWD showed avoidance of certain questions.

4 Discussion and Conclusion

In general, the reactions to Babbelbord were positive - a physical interactive board game brought back a feeling of familiarity while gamifying and personalizing the reminiscence experience helped improve engagement in conversation. However, attention should be paid to the creation of the questions - these should be easy to understand and should be personalized such that sensitive topics can be avoided.

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