

Impact case study (REF3)

Institution: Glyndŵr University		
Unit of Assessment: UoA11 Computer Science and Informatics		
Title of case study: Memory Tracks		
Period when the underpinning research was undertaken: November 2017 – August 2019		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Stuart Cunningham Richard Picking Joanne Pike	Reader (2016 – 2018) Professor Principal Lecturer	May 2003 – June 2018 August 1999 - present May 2001 - present
Period when the claimed impact occurred: Spring/Summer 2019		
Is this case study continued from a case study submitted in 2014? N		
1. Summary of the impact (indicative maximum 100 words)		
<p>Memory Tracks is a mobile app intended to improve wellbeing of people living with dementia. The research in two Welsh care homes in 2018 examined use of the app as a way to promote song-task association with the potential for positive changes in behaviour, ability and routine. Quantitative measures indicated a significant difference in overall average happiness of the individuals studied. Care staff reported that key tasks, such as personal care of residents, were easier to manage, releasing more time to offer higher quality care. The research has allowed the platform to be refined to better meet user requirements.</p>		
2. Underpinning research (indicative maximum 500 words)		
November 2017 – February 2018		
<p>The project team was established (the Glyndwr University staff, two academics from University for the Creative Arts, the Director of Memory Tracks Ltd, and representatives from the Pendine Park Care Organisation in North Wales). This initial stage consisted of a scoping and fact-finding exercise and high-level exploration of the users of the Memory Tracks platform, and typical scenarios and use cases, allowing us to refine the plan for the full-scale study of Memory Tracks in-situ. A group of participants was identified in collaboration with Pendine Park and a set of tasks from each participant's daily routine was identified as being allocated to the Memory Tracks app. This meant that when those activities took place, the Memory Tracks app would play an appropriate piece of music with the intention of taking advantage of song-task association. The hypothesis was that song-task association could demonstrate benefits in reducing the confusion associated with many forms of dementia and, as a result, reduce levels of agitation or distress. During this stage the application for research ethics was completed and appropriate gatekeepers were identified and engaged with according to the protocols of the University. A summary of the activities was published (Whalley <i>et al.</i>, 2018) [reference 1].</p>		
February 2018 – August 2019		
<p>The main research activities consisted of a mixed-methods cohort study, where the fourteen residents (in Pendine Park care homes in Wrexham and Caernarfon, North Wales) were observed over a period of weeks prior to the introduction of the Memory Tracks platform. These observations continued following the introduction of the platform for four additional weeks. Care staff at Pendine Park had been trained by the research team to use the app and observational tools, using the app with the residents selected for the study in conjunction with specific daily tasks, such as getting out of bed, taking medication, getting dressed, eating lunch, or receiving personal care. Relevant music was selected for each task from the database of songs available</p>		

and matched to each resident using their demographic information: principally their year of birth and where they spent their childhood. Quantitative measurements were taken on a daily basis prior to, and during, use of the mobile app over several weeks. The sources of the metrics are indicated below. At the end of the research period a series of qualitative interviews were undertaken with care staff in the Pendine Park organisation, complementing the quantitative observational measures taken. The study is described in Cunningham *et al.* (2019) [reference 2], which was in a special issue of Healthcare Engineering relating to advances in development accessibility, inclusion, and rehabilitation using Information Technologies.

Observations related to six established measurements: arousal, valence, dominance, physical health, memory, and life as a whole. The first three of these are drawn from the Self-Assessment Manikin pictorial scale for emotion (M. M. Bradley and P. J. Lang, "Measuring emotion: the self-assessment manikin and the semantic differential," *Journal of Behavior Therapy and Experimental Psychiatry*, vol.25, no.1, pp.49–59, 1994.) and the final three measures were questions taken from the Quality of Life in Alzheimer's Disease (QOL-AD) questionnaire (R. G. Logsdon, L. E. Gibbons, S. M. McCurry, and L. Teri, "Quality of life in Alzheimer's disease: patient and caregiver reports," *Journal of Mental Health and Aging*, vol.5, no.1, pp.21–32, 1999).

3. References to the research (indicative maximum of six references)

1. Whalley, J. H., Cunningham, S., Brill, M., Edwards, S., Anderson, G., & Simpson, P. (2018). Memory Tracks: song-task association in dementia care, a preliminary study. In: Solent Research, Innovation and Enterprise Conference, 2-3 May 2018, Southampton Solent University. [<https://research.uca.ac.uk/4810/1/memroy%20track%20poster%20whalley.pdf>]
2. Cunningham, S., Brill, M., Whalley, J.H., Read, R., Anderson, G., Edwards, S., & Picking, R. (2019). "Assessing Wellbeing in People Living with Dementia Using Reminiscence Music with a Mobile App (Memory Tracks): A Mixed Methods Cohort Study". *Journal of Healthcare Engineering*, vol. 2019. [<https://doi.org/10.1155/2019/8924273>]

4. Details of the impact (indicative maximum 750 words)

The research was undertaken in collaboration with Memory Tracks Ltd, initiated by a partnership formed in a GuildHE Research Network (then the Consortium for Research Excellence, Support and Training - CREST) two-part Sandpit event in November 2017 and February 2018. The outcomes of the Sandpit resulted in the University for the Creative Arts (UCA) being awarded funding on behalf of the partnership by GuildHE to undertake a substantive study. UCA had an existing relationship with Memory Tracks Ltd and Glyndwr University drew upon its long-standing collaboration with Pendine Park care homes. UCA provided input into the design of the Memory Tracks app and expertise in stakeholder engagement and qualitative methods, whilst the Glyndwr University team were responsible for designing the research activities and performing the quantitative data analysis.

The impact reported here occurred in Spring and Summer 2019. The beneficiaries were individuals living with dementia (in two care homes in North Wales) and their carers.

(i) Using the six measurements (arousal, valence, dominance, physical health, memory, and life as a whole), there was a significant difference noted in overall average happiness of the residents studied whilst using the Memory Tracks app. Whilst there were improvements in physical and cognitive abilities for some of the participants, a third element of ability appeared to develop, that of independence. It appeared that the app helped some participants to do small tasks independently that they had not been able to do previously, thereby improving their motor skills and memory of doing it prior to the onset of their condition. It appeared that wellbeing, overall health outcomes, and quality of life were enriched. There were improvements across the other five measures, however they were not statistically significant.

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(ii) The response from care staff was more positive than anticipated. During the training sessions, some of the care team had not used technology in conjunction with their work, but they quickly took to using it in practice. In some encouraging feedback, interviewees found that key tasks, such as personal care of residents, was easier to manage, therefore impacting work activity, performance, and their practice overall. As a result, it allowed more time to offer higher quality care to residents. There was also broad affirmation of the quantitative findings on general improvements in happiness. Some staff, and the care home management, suggested that longer-term use of Memory Tracks could lead to health improvements and a reduction in the need for external professional care, such as GP or nurse visits.

(iii) The study has highlighted use cases and scenarios that have allowed the Memory Tracks platform to be refined and updated to better meet the requirements of its user population and demonstrate the feasibility for Memory Tracks to be deployed into other care settings with people living with neurological issues, such as acquired brain injury or autism.

5. Sources to corroborate the impact (indicative maximum of 10 references)

1.
Consultant Artist in Residence, Pendine Park Care Organisation
(corroboration of research activities and impact)
2.
Letter from Consultant Artist in Residence, Pendine Park Care Organisation
(corroboration of research activities and impact)
3.
<https://www.memorytracks.co.uk/research/> <https://www.memorytracks.co.uk/product/>
(Nature of the app; confirmation of the research involving Memory Tracks Ltd)