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their care. However, using this technology in an assistive way to build an ecosystem of smart devices and sensors using Internet of Things (IoT) technology is an unfamiliar concept, unknown to both health and social care providers and the general public. The digital infrastructure required to realise this idea is also not currently available to the majority of regional care providers in the UK. This paper presents a case study where assistive technology and IoT are being used to address the challenges of providing health and social care in Barnsley Metropolitan Borough Council.

Method: The aim was to simulate a smart-home test bed that can demonstrate to care providers across the country, the capability of consumer IoT technologies and the benefit they provide to increasing the quality of care. Initially, interviews were conducted with members of Barnsley Council and health and social care professionals, as well as research to explore the multifaceted capabilities of consumer technologies to aid with lifestyle monitoring and residential assistance. Key target areas were identified based on the proportion of resources being spent on health and social care. Within this study, a scale physical model of a smart home was created, containing sensors to mimic current consumer technology. This model house served as a testbed that facilitated easy and quick simulation in a number of configurations. These sensors were evaluated on their ability to fulfil the monitoring needs of patients with frailty, dementia, learning disabilities, and mental health issues. A feasibility case was also built to help catalyse the process of implementing these new technologies amongst the services of healthcare providers across the country. Finally, an IoT digital framework was designed which would be accessible to prospective patients and social care bodies, working on a feedback loop system to provide information about the optimum technology available to suit each need.

Conclusion: The future of residential healthcare may lie within the optimisation of AT using IoT. In this study, we are developing this through linking a digital IoT framework with data collected from a simulated smart home environment. Although this study is only the first step towards a more efficient system, we believe that IoT may be integral to providing patients the independence they may not currently be receiving.

Keywords: IoT, residential-healthcare, smart-technology, lifestyle-monitoring, alzheimer's

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Waking-up in the Morning: A Gamified Simulation in the Context of Learning Activities of Daily Living

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Background: The degree of child independence in Activities of Daily Living (ADLs) is crucial for parents, caregivers, educators, and therapists. Achieving basic skills is vital not only for children with developmental disabilities but also for typically developing preschoolers and primary school students. People with developmental disorders often have difficulties while performing ADLs, (e.g. dressing, cooking, cleaning and personal hygiene), whose acquisition leads to increased independence; therefore teaching focuses on conveying functional skills.

The relevant literature suggests that children with developmental disabilities face the following difficulties:

– comprehension of symbolic play and pretense
– low imagination level
– resistance to changes to their environment or daily routines
– limited ability to identify with others
– trouble applying what they have learned to real life

Three instructional approaches are commonly applied to promote daily living skills: (1) *in-vivo instruction*, (2) *video-based instruction (VBI)* and (3) *computer-based intervention (CBI)*. The problem with all three approaches individually is that application of taught skills to real life is very difficult for children with a limited ability to identify with others.

In order to overcome this difficulty, we are designing and developing an interactive simulation game called "*Waking-up in the Morning*" with image fidelity to ensure natural representation and better transfer of skills to real-world conditions. Our research questions are listed below:

– can the game function as educational material in the context of ADLs, both for students with special educational needs and their typically developing peers?

– can gaming become the bridge between children regardless of their cognitive profile, promoting collaborative learning through peer-mentoring?

At this stage, alongside the game development per se, several of its aspects are examined (e.g., gamification techniques and interface design), taking into account users' evaluations and feedback (students with developmental disabilities and typically developing students) and game design experts.

Method: Our main goal is to investigate transmedia learning in inclusive conditions through gamified content that combines the three instructional approaches (*in-vivo instruction*, *VBI* and *CBI*), traditional gaming modes and cutting-edge technologies: cards, virtual/augmented reality and 360° interactive videos. VR-enabled headsets, laptops, tablets, smartphones and interactive whiteboards will be used, depending on the player-learner's characteristics. Our literature review establishes the benefits that emerging technologies bring to individuals with special educational needs, as well as obstacles they face in the use of VR devices, which are necessary to support novel gaming methodologies. The target group combines typically developing children aged seven years old and individuals with developmental disabilities of similar mental age. The simulation game will be tested in inclusive environments in general schools.

Conclusion: The purpose of this paper is to present our alternative approach, game design and production for teaching ADLs using cutting-edge technology. In the near future, we will examine if the proposed simulation game can be used to support different learning styles and differentiated instruction. The ultimate goal of the research is to suggest good practices in the field of gamified and highly interactive digital learning materials for the implementation of inclusive education.

Keywords: Activities of Daily Living, Interactive 360° Game, Simulation, Transmedia Learning, Virtual/Augmented Reality.

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