

# Pokémon Go: Ubiquitous Computing Delivering Better Health or Co-Incidental Health Benefits from Technology Use? A Participatory Observational Study

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**Abstract.** Stimulating sustained behavioural change through information and technology has been an aim of much health informatics research. Traditional approaches use technology to mediate communications between health professionals and patients. More recent lifestyle technologies engage the patient directly with information and advice – but what of the phenomena that is Pokémon Go – does it point to another way of achieving health benefits through fun? This paper aims to explore some of the conceptual questions for health informatics stimulated by the phenomenal popularity of Pokémon Go. The paper is grounded analysis of data generated through a preliminary participatory observational study in Australia.

**Keywords.** Ubiquitous computing, health informatics, ehealth, communication.

## 1. Introduction

Walking in a usually very quiet park recently during a cold winter night, we discovered an emerging and exciting scene - a large group of people, holding their mobile devices and walking around in all directions apparently searching for something. Young adults, children, parents and elderly people from what appeared to be a diverse cross-section of the community were all engaged in the same physical activity. Intermittently the quiet night was penetrated by an exciting high-pitched call of “A Pikachu! There is a Pikachu, CP 520, have you caught it?”. Everyone then rushed to the location identified and their faces were reamed in smiles shortly thereafter. Subsequently people were seen to chat about and compare their prize possessions as well the number of kilometres walked to “hatch an egg”. With more than 500 million downloads since July 2016 Pokémon Go [1], appears to be achieving what much health IT has failed to deliver for decades – encouraging large sections of the community to participate in physical activities that deliver positive health benefits!

Of course, people in a park are not patients in a hospital but in the era of chronic diseases and the widespread diffusion of lifestyle technologies (e.g. WiiFit, Endomondo, Fitbits) these behaviours by a cross-section of the community do stimulate a number of questions about evolving interactions between technology, users and their health that deserve further attention [2]. Is Pokémon Go the type of disruptive innovation that the healthcare system needs? Does Pokémon Go highlight new ways

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for health informaticians to conceptualise the nature and type of socio-technical interactions that drive health behaviour changes? Is Pokémon Go just a fad delivering co-incidental health benefits that will prove to be unsustainable over time? This paper aims to explore some of these questions and is grounded in analysis of data generated through a preliminary participatory observational study in Australia.

## **2. Interaction of technology and lifestyle measures in health improvement**

The healthcare system is at a cross-road. In part, this is due to the ageing population. In part this is due to lifestyle factors that have contributed to a rapid increase in obesity and sedentary lifestyle related diseases [3]. Simultaneously, advances in healthcare have increased life expectancies of the population especially in developed world. These advances have also contributed substantially to increases in the cost of healthcare delivery. Many developed countries are spending nearly 10% GDP on healthcare and it is evident that this is unlikely to be sustainable in the longer term [4]. To maintain high quality healthcare and improve quality of life for the population it has been identified that innovations that encourage individuals and communities to reduce disease burden, especially life-style related diseases are required. This is especially the case for under-served and marginalized communities [5].

Technology advances, especially electronic devices, have been considered to be the much needed innovation required in healthcare in order to tackle problem such as obesity and lifestyle related diseases [6]. The range of technologies currently utilised includes alert and warning system on electronic medical records to remind healthcare professionals to discuss life-style changes [6], direct promotion of healthy lifestyle messages to patients and systems that educate patients directly through their mobile devices [7]. Mobile technologies, application and services have also been developed to support patients in goal-setting and measuring activities and bio-signals as mechanisms to contribute directly or indirectly to improve health outcomes. Significantly, it is noticeable that the vast majority of these technologies, applications and services have been conceptualized as the ‘agent of change’ for delivering information to participants necessary to encourage and engage individuals to ‘do the right thing’. Given the variability of success of this ‘info-centric’ approach for different types of ‘users’ and failure to often understand the motivations and contexts of use within these technologies, the approach and impact of Pokémon Go is certainly provocative.

Pokémon Go, aims to use local geo-location information to encourage participants to exercise. Pokémon Go has a proven worldwide appeal and has also grabbed news headlines sometimes for all the wrong reasons [8] – either way it has certainly had an impact way beyond the mobile and augmented games community. From a health technology perspective, the game’s ability to stimulate individuals and groups to exercise as a by-product of game play appears, at least in the numbers of people playing the game, to warrant further investigation and discussion.

Certainly the emergence of augmented reality game-playing appears to differentiate Pokémon Go from other technologies, applications and services that have aimed to stimulate health behavior changes such as physical exercise. However, at a conceptual level questions remain as to whether this indicates a fundamental and sustainable method that can be emulated to improve population participation in exercise and other lifestyle behavior changes or whether it is a passing fad that will only temporarily and co-incidentally deliver health benefits? Beyond these questions, it

is also worth considering whether the effects that are being witnessed within the Pokémon Go game playing community are evenly distributed, equally effective for one individual or another and/or whether the benefits acquired disproportionately target those amongst the game-players who are most susceptible to gamification tactics/strategies being employed by the games developers.

This paper commences an investigation of some of these issues through data collected and analysed based on a small participatory observation research method deployed in Tasmania, Australia

### **3. Study design**

This preliminary participatory observational study aims to understand Pokémon Go as a technology to improve healthcare of the population. The analysis, interpretation and discussion of the data collected aim to explore at a conceptual level how Pokémon Go is different from more conventional health technologies, applications and services focused on stimulating health behavioural changes in the community.

The study was conducted from July to August in 2016 since the availability of Pokémon Go. The study was conducted by two of the authors through active participation in using the technology as well as observations of other players (approximately 100 other players) during the author's utilisation of the technology over a 6 week period.

Personal participatory field notes as well as observational field notes were obtained regarding using the technology and human behavior and observations during observation. Personal participatory field notes informed finding 4.1 and 4.2 and observational field notes informed finding 4.1 and 4.3. The data analysed using thematic analysis. Usability assessment by public was assessed by observation and incidental comments by users in public parks.

### **4. Results**

The results of the study are structured into three main domains: Usability of the technology from a population base perspective, utilisation of the technology on individual life-style behaviors and utilisation of the technology and the public

#### *4.1. Usability of the technology*

Pokémon Go is a very user-friendly technology and does not require much training for most mobile phone users. For tablets users, the application provides good usability but can reduce individual user's environmental awareness due to obscuring the view of physical structures and dangers. These impacts were evident during the observation period, with people of all ages actively playing the game and some individuals appearing to occasionally stumble or bump into things due to overly concentrating on game-play.

The application uses local geo-location information to engage users, making the application relevant to their local socio-environmental circumstances and this appears

to be a major element of its attractiveness as well as the novelty of its capacity to augment-reality with super-imposed characters & artefacts.

More recent versions of the application now provide warnings for drivers and users regarding environmental awareness, especially when the speed of movement exceeds certain rates. This process, however, has a problem with sensitivity and specificity as the authors experienced the warning when running on foot. Clearly usability and functionality continue to evolve and the developers are very active in examining and responding to feedback from ‘gamers’ as well as broader input from governments and communities around the world who have expressed some negative concerns about its impact.

#### *4.2. Utilisation of the technology and impact on individual life style behaviors*

Pokémon Go encourages individuals to participate in physical activity. The physical activity for most players involves walking outside in public environments. While it is possible to “catch” pokémon and to collect “items” while driving (as a passenger) or cycling, some of the “rare” pokémon require individuals to walk to areas that are not accessible by vehicles. As such, the application generally does appear to encourage physical activity but from observation this is not equal levels amongst players and perhaps it is no surprise that the younger players are more physical active and play for longer than others. However, more positively, during the observation period, many participants walked between a few poké-stop which are 200-300 metres apart to obtain poke-balls to catch pokémon.

Pokémon Go also encourages goal setting for exercise at a time and place that is suitable for the participant. The function of “hatching” an egg, especially given the longer distance of walking required to “hatch” an egg and also factors such as how, when and where the more rare pokémon are found appears to provide considerable motivation for exercise by players. For children in particular these motivating factors i.e. needing to walk a certain distance to “hatch” an egg appeared to be a very effective method for encouraging them to exercise more.

#### *4.3. Utilisation of the technology and the public*

Pokémon Go also appears to encourage ‘group interaction and game-play’ with large numbers of participants observed in important locations within specific communities such as public parks. This socialization appeared to also create an environment that made the game-playing more attractive to engage in by providing users’ with a common discussion theme. Furthermore, during the observation, the authors found that the conversation quite often involved goal setting of “hatching” an egg or walking somewhere to catch a rare pokémon. As such, the application may be serving as a platform for mutual encouragement within the community to participate in exercise.

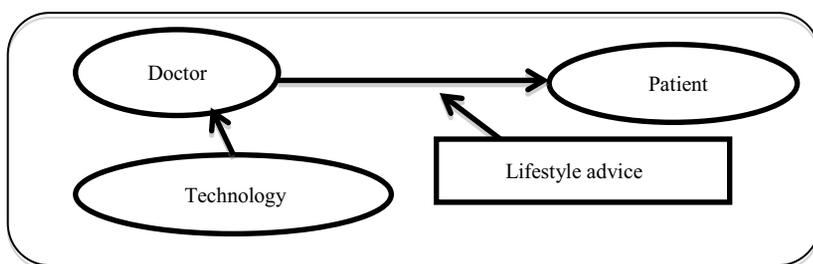
## **5. Discussion**

Pokémon Go appears to be a user friendly mobile augmented reality game that actively encourages individual’s and communities to engage in socialisation and physical exercise. In a very short period of time, this game has stimulated a highly visible set of changed behaviours that can be seen to have health benefits for end-users. Significantly,

the method of stimulating these changes behaviours through entertainment and fun appear to be able to achieve, at least in the short term, patterns of behavior that lots of ‘info-centric’ client focused health technologies, applications and services have failed to achieve. It would be interesting to explore whether this socialization could also reduce isolation typically associated with technology and gaming to contribute to other physical and mental health benefits derived from socialising.

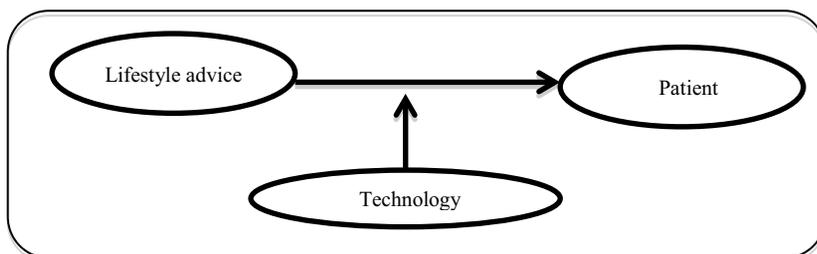
Clearly the sustainability of the effect this application achieves over the longer term, especially amongst participants who have captured all the pokémon, is yet to be established. There are also a range of unintended and potentially ‘unhealthy’ consequences from engaging in game-playing. However, without doubt Pokémon Go does stimulate thinking about the relationships between technology, users and health for the health informatics community. Pokémon Go demonstrates at a conceptual level, a potentially new and innovative way to engage users and participants in lifestyle modification.

When health technologies were first implemented with end-users, they tended to be used as a method for enhancing and encouraging interactions between healthcare professionals and patients for lifestyle and behavioural change management. Drawing on models of chronic disease management and psycho-social models of health behaviour change many attempts to support patients to improve self-management behaviours have been published [9] – with varying degrees of reported success and sustainability of behavioural change (Figure 1).



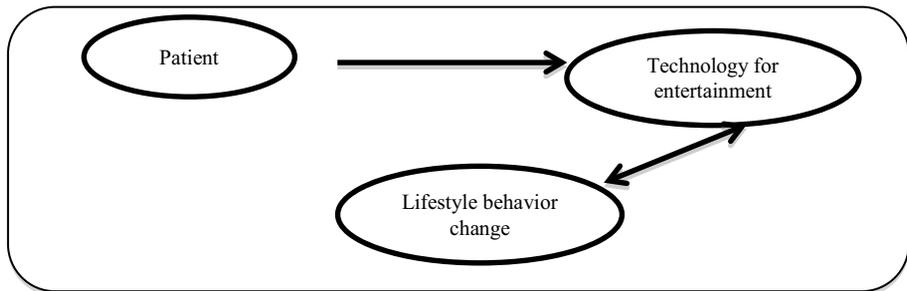
**Figure 1:** Health technology through healthcare professionals

Subsequent client focused health technologies, applications and services, such as exercise applications and recipe applications deliver the message of healthy lifestyle directly to the patients [10]. The advent of mobile technology has allowed almost ubiquitous access to monitoring, measuring and presenting to end-users health related data, information and advice on health behavior modifications. Patients often do not need to consciously use the technology as messages and data are automatically calculated and exercise targets and achievements recorded (Figure 2.)



**Figure 2:** Health technology directly to patient.

Pokémon Go appears to present a change in the relationship between lifestyle advice and end-users. In Pokémon Go the lifestyle advice is no longer a direct objective of the application. The main interaction is between the user and the technology as part of an entertainment or game that has embedded within it lifestyle modification of behaviors. The application does not deliver advice, the application delivers lifestyle outcomes. As such, it can be argued that the application is truly people-centred and by using the technology, the lifestyle changes is achieved ubiquitously (Figure 3).



**Figure 3:** Patients participate in lifestyle change via technology.

## 6. Conclusion

The real test is sustainability. What happened when all the pokémons are caught? There is also no impact data on health outcomes using Pokémon Go. It is likely that the next phase in the development of technology will need to focus on patient's need from the perspective of entertainment and technology which embeds ubiquitous health behavioural changes. For now, Pokémon Go appears to be the much needed innovation and development in technology and healthcare.

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