

# The impact of Pokemon Go and why it's not about Augmented Reality - Results from a Qualitative Survey

**Abstract**—Pokemon Go is a mobile game that uses geolocation and Augmented Reality (AR) to bring little monsters into the real world. In this paper, we want to outline a qualitative study which focuses on socio-technical effects of this game onto the players themselves. Episodic interviews are used to collect data which is then coded by an approach close to Grounded Theory. The results contain theories with quotations from the participants. On the technical side, players judge AR as hardly relevant for the game and more useful for advertisement through media coverage. Even though Pokemon Go is an AR game, this feature suffers from bad usability. Our results confirmed that AR is neither important for gameplay nor it is the source of any danger for players, since it is hardly used anyway.

**Index Terms**—Augmented reality, Mobile applications, Socio-technical study

## I. INTRODUCTION

Pokemon Go is a mobile game which includes Augmented Reality (AR) with geolocation. According to Biseria and Rao [1], the game broke all records. It was downloaded by more than 30 million people in merely 14 days. Pokemon Go was developed by Niantic and Nintendo for iOS and Android and released on the 5th of July in New Zealand and Australia and on the 13th of July in Germany. However, the game got popular so fast, that it was (illegally) downloaded using Australian servers beforehand. As one result, Nintendo's stock market value increased by \$7.5 billion within one week [2].

Pokemon Go is a geolocation-based game. The player's position in the real world matters. They have to go outside, discover the world, and catch little monsters called Pokemon. Captured Pokemon can then be trained to become stronger. Players can join teams and let their trained Pokemon battle others to win prestige. The location is tracked using GPS or WiFi to link Pokemon and virtual buildings such as "gyms" to real world coordinates. In order to catch Pokemon or interact with buildings, a player has to be in a certain distance to it (see first image in Figure 1). The game contains over 250 different Pokemon which can be found at different locations, animating players to find and catch them all. On top of that, the game uses the smartphone's or tablets' camera to show Pokemon in the real world (see second image in Figure 1). Finally, the game splits up the trainers into three different teams (red, blue and yellow) which leads to an endless competition. Players can fight for dominance by winning battles with their Pokemon against the Pokemon of other players (see third image in Figure 1).



Fig. 1. Screenshots of Pokemon Go: Player located on a map using geolocation (left), Pokemon using Augmented Reality (middle), and Pokemon battle in a gym (right).

Pokemon Go also is a game which brings mixed-reality gaming to the mass market. However, little social-technical research about the game has been done regarding the game's central properties. In this paper, we inductively generate theories about the game, focusing on the players themselves. After presenting related work about the game and the methodology, we look at the why and how trainers play, and give insight into positive or negative effects of playing (according to the players). Finally, we address questions about AR and what the players think of this technology. Note that the theories here will show relations and effects between game and real life and are based on the qualitative data from this work.

## II. RELATED WORK

### A. Pokemon Go

Maeve Serino et al. highlight potential benefits for children, e.g., improved social and cognitive skills, educational development, or overall health [3]. They note positive effects of outdoor activity, active learning throughout local neighborhoods, but at the same time warn parents and pediatrics about negative economic consequences (phone data) and physical harm (dangerous places for playing) [3]. In contrast, Healthcare Information Research (HIR) still sees a potential integration of big data and AR applications into the health system and argue that Pokemon Go might just be a foundation for it [4].

Triton Ong explains the success of Pokemon Go with behavioristic theories. The game contains a lot of reinforcements which are coupled to physical activities like finding Pokemon, visiting Pokestops and Pokegyms as well as hatching eggs.

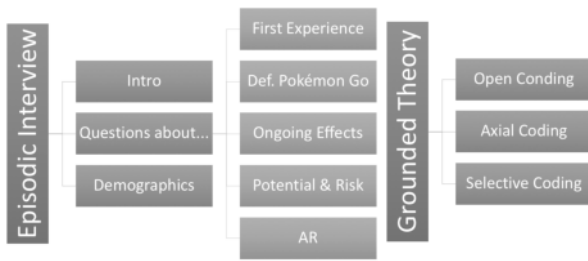


Fig. 2. Main steps within data gathering and coding.

These reinforcers often target social behavior even though they are not explicitly instructed by the game. Ong concludes that Pokemon Go is an inspiration for behavior science [2]. Williamson agrees with these ideas, calling the physical activity a by-product rather than an explicit component. Random reward structures, Pokemon nostalgia, collecting items and AR lead to social interaction and recognition for achievements without a defined end point. These ideas make the game highly attractive, however, sustainability and an impact on health aren't still clear and therefore future surveys need to be conducted [5].

Ashish Gupta states possibilities and risks of this AR game, focussing on the facts that the game already helped to catch criminals and created benefits for business ventures. However, he also states the game made players go into restricted areas or continue playing in inappropriate settings (e.g. funerals) [6]. AR has also created a stupendous success for the game and has the potential to vastly transform teaching and learning [6]. Kriti Singh supports the possible dangers of AR that are mentioned by Gupta and adds security issues like the fact that the game transmits not only images but also exact positions of player among other data. He supports his claims with a statement from the pentagon which prohibited playing the game on governmental cellphones [7].

### B. Grounded Theory using Episodical Interviews

In this study, episodical interviews which is a well known technique in qualitative research [8] are used in order to generate data. It can be used in a variety of setting and participants including novices, professionals and for evaluations [9]. Since episodical interviews produce unstructured text, coding the participants' answers is necessary. Grounded Theory is an inductive technique that tries to find theories within data [10]. Therefore, it does not start with a hypothesis or fixed samples. Instead, it first uses open coding to label the data, then axial coding to find relations and finally selective coding to combine all the codes into one (or a few) core categories [11], [12].

## III. METHODOLOGY

Figure 2 outlines the methodology employed to gather data used in this study. Episodical interviews lasted about one hour with roughly 40 minutes as the shortest and two hours as the longest duration.

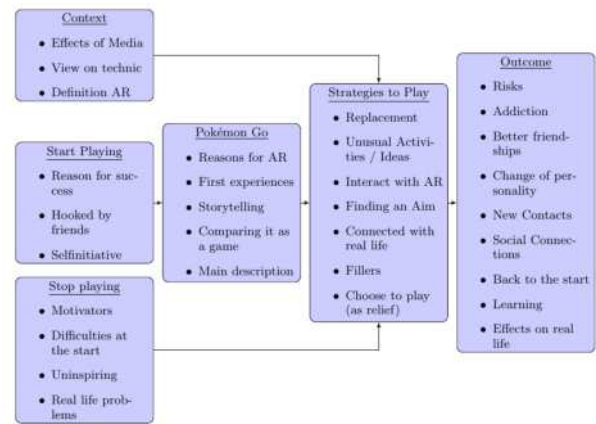


Fig. 3. Identified categories with their main codes.

The interviews always started with some general introduction about episodical interviews, followed by the task to describe the participant's first experience with Pokemon Go. It also always ended with some demographic data and an open question whether the participant has anything that he or she thinks is missing. According to the idea of episodical interviews, the rest of the time was not fixed to a certain plan and can be compared to a normal conversation. The participants could mainly choose the topics and only if they did not move on or stopped explaining, were guided into a new direction. An example in [9] was used to generate the questions by translating the domain so they address the question how players interact with the game and how the game influenced their live. Additionally, questions about AR were added.

## IV. RESULTS

### A. Sample

All participants had to at least have played Pokemon Go. It was not necessary that they still play, however, it was made sure that the sample contained both quitters and ongoing players. 18 people participated in the study. The participants' age ranged from 17 up to 27 (mean = 20.8, sd = 3.1). Most of them are students, four are pupils and three employed persons. The participants live in Germany, Austria, Switzerland and Luxembourg.

### B. Theories

Figure 3 shows the categories and their codes spread across the relations around Pokemon Go and AR. Afterward, single theories are listed with quotations from the interviews that support these ideas.

#### 1) Theories about starting to play the game:

T1: Early Players start playing because of Pokemon in real life (and that's it).

VP04: "... I downloaded the game before the official release and I was really thrilled..."

VP02: "... Now I was the protagonist which normally you just could control in the [other Pokemon] games".

Interviewer: “What was the main reason for the success?” VP10: “The Pokemon franchise.”

The players that started playing first are largely all thrilled by the idea of finding their childhood dream now in the real world. The reason why they pick up the game (even pre-release) is mostly centered around finding Pokemon. Other features like AR, fighting or Pokemon as an app are hardly mentioned. However, they are not the largest group as theory two will show.

T2: The main reason to start playing is other people that play it.

VP03: “... I knew [the game] from friends and at first I didn’t want to play since I had to do some much for the university, but then I also went for it.”

VP07: “It was quite a hype and my friend wanted my ID to play it, so we went for a walk together ... I just play it if others come along.”

By far the most people in my interview reported that they started playing the game due to others that want to play or are already playing (mostly because of theory one or other friends). Since this is a cascading effect, one can easily explain the great success within the first weeks using theory one and two.

T3: Individual start without knowledge is hard.

VP05: “I was curious, so I installed [the game]. But I missed an introduction ... it took a while until I got the idea of Pokemon.”

VP09: “At first, I hated it since all of my friends [played it] and looked at their phones constantly.”

Only a few players reported that they did not start before the official release or due to others. Then, they often experience some kind of difficulty with the game itself (learning it) or with their social surrounding (being an outsider). However, they still might like the game after some “play testing”, depending which kind of player (see next section) they are.

### 2) Theories about effects on daily life:

T4: Playing the game does not create new relations, but supports existing ones, even with non-players.

VP04: “I lost any contact to people that I got to know due to the game.”

VP14: “I went outside with my dad more often [...] and Pokemon Go was the deciding reason.”

VP16: “You even could talk about [the game] with people who are not fans...”

A clear result is the fact that the game does not create new friendships. People that meet only for the game for the first time or randomly will mostly never see each other again. However, it is quite different with relations that already exist. The game brings them together (more often) and allows social interaction, even with people, that don’t play or don’t know Pokemon at all.

T5: By now, the game mostly amplifies motivation but is hardly the main reason.

VP04: “I realized that I went outside earlier or longer [when I had to go somewhere].”

VP14: “For example today, I went for a walk with my mom due to Pokemon Go.”

For most players (if they do not play extremely competitive), the game is by now never the main reason to go outside. However, they often connect playing the game with doing something they should / need / want to do anyways. Also, some participants notice, that the game might be the final reason to start doing things. One, therefore, must say, that the game in a way helps other motivation by adding itself on top of it.

T6: There are just small long-term effects on players.

VP07: “I went to places that I normally would not visit and you get to know the points of interest...”

VP02: “It was just a game and now everything is in the past.”

Like any game, Pokemon Go has (according to the players) no real long term effect. There are special cases (even in this study), that tell a different story, but these people are rare. However, most players recognize that the game made them visit new places and they learned quite a lot about their surrounding.

### 3) Theories about technology (and AR):

T7: Technology is not really interesting.

VP03: “I see [the game] just like a normal mobile game.”

VP16: “The game showed me again how things like privacy can suffer.”

Nearly everyone stated that the technology is in some way not interesting, ordinary or not new. Others claims are largely negative with privacy matters (needs GPS all the time) first and problems with battery (drains energy extremely fast) second.

T8: Nearly everyone has a sort of misconception about AR.

VP05: “[AR] is a game concept which links the real word into the game. Therefore you need to interact with it. (with the real world)”

VP: “[AR is] the transition between real and virtual world [like] geolocation.”

Only a few players did not know what AR is and a lot of them described Pokemon Go as an AR game. However, their mental model is either wrong or quite narrow: Nearly all of them focus on gameplay, interaction or any kind of linkage between real world and data.

T9: AR is hardly important, nor the source of danger.

VP05: “[AR] was horrible since it made catching Pokemon so much harder ... it was funny ... but I never used it.”

VP11: “[AR] gave me a lot of problems and I might have played the game longer without it.” VP17: “[AR] was a huge deal, [...] since it was really nice to see Pokemon in the real world.” VP07: “Once, I nearly walked in front of a car ... I looked at my phone more often due to Pokemon Go.”

T10: Media is seen largely positive.

VP03: “The only crazy report from the media was about people that cheat or travel around the world...”

VP13: “It’s like any Pokemon nerd’s dream [to see] photos with Pokemon in real life .”

Even though media might report positively and negatively about the game, players themselves focus more on the positive aspects. Negative aspects or stories were only mentioned in relation to some of their own experiences.

No player could define AR truly correct and the registration in 3D described by [13] was never mentioned. The quotes also show, that AR is valued differently, however, nearly all of the players don’t value it at all regarding gameplay (VP17 is a rare occasion). This is due to the fact, that the usability of the AR system is extremely bad since it makes the main task (catching Pokemon) much harder and also leads to phone crashes. This also brings up the conclusion, that AR is not the source of any danger since it is hardly used. (Additionally, you don’t have to move while catching Pokemon with AR.) The main problem is the principle behind the geolocation system. This forces the player to constantly check for Pokemon on their phones (and move to inappropriate places).

### C. Core Theories

#### 1) *Pokemon and friends are the reasons for the success.*

Looking at the theories 1-5 and 10, the first wave started with players that are highly interested in Pokemon. However, the largest group are the people that start playing because of their friends. The data also shows, that there is the player type of *social players* that quickly will stop playing if their surrounding also stops.

Most players use the game as diversification and / or play it when they walk anyway. The game therefor mostly offers (only) additional motivation to do positive things in real life with friends (outside).

2) *Pokemon Go is not really an AR game (for players).*: As shown with the theories 7-10, players may say that Pokemon Go is an AR game. However, they mostly relate this concept to something else, mainly the geolocation system. They may also see positive (e.g. being outside) and negative (e.g. constantly looking at the phone) effects, however, these are all not related to the AR feature. Furthermore, success is mostly linked to the Pokemon franchise and most players turn AR off due to its bad usability. The only larger effect of this technology can be seen in traditional and social media using the camera to create funny pictures of Pokemon all over the world. It can therefore

be argued that Pokemon Go did not bring AR to the players nor mass market, but instead more to the media.

## V. CONCLUSIONS

This paper addressed the question how the mobile gaming app Pokemon Go influences players’ lives. There is little scientific work done yet that describes this socio-technical impact and most knowledge is based on intuition and/or media reports. Therefore, no concrete hypothesis was formulated in the beginning which led to a qualitative study in order to inductively generate ideas. Episodic interviews were used to generate data which then was coded by a Grounded Theory approach.

The results show different theories which were grouped into the categories *Theories about starting to play the game*, *Theories about positive effects on daily life* and *Theories about technology (and AR)*. These outline, that Pokemon Go started with Pokemon fans, followed by friends (and then their friends). The game can be played quite differently and supports real life actions, but only existing structures, by offering additional motivation. Even though it is an AR game, this feature is neither important for gameplay nor it is the source of any danger for players, since it is hardly used anyway.

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