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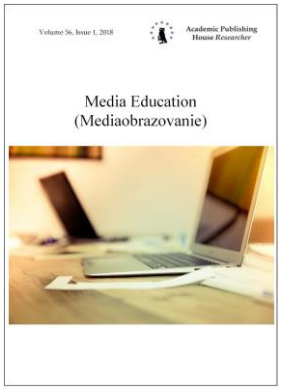

Educational Value of Mobile Games Using Augmented Reality in Urban space – Participatory Observation of the "Pokemon Go!"

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Abstract

AR technology creates the possibility of overlapping two realities. It is a space used, among others, in education. AR increases the visual attractiveness of the game and the involvement of its users. However, some applications were not created with the intention of using them for this purpose, although they have the potential not only to entertain but also to teach. One of such games is "Pokemon Go!". which The following research methods were used in the study: 1) in-depth interview to learn about the specifics of the game "Pokemon Go!" and its potential educational opportunities; 2) observation allowing to write down the behavior of players while using the game; 3) a survey to find out the motivations and thoughts of the players. It was attempted to determine whether there will be any interaction between the players and the physical locations used in the game, using the format of the game chosen for the study, which was the passage along the proposed route. It turned out that thanks to the players' suggestions, a potentially optimal way of using the game was determined, which could be used in further research on the phenomenon of the educational dimension of the "Pokemon Go!" game.

Keywords: AR, media literacy, media education, mobile games, Pokemon Go, geolocation games.

1. Introduction

One of the foundations of media education is the use of modern technologies in didactics (Drzewiecki, 2010). The aim of their application is to increase the attractiveness of the message, and thus to achieve higher assimilability of the presented material (Dejnak, 2012; Bougsiaa, 2013). This is how AR (Augmented Reality) technologies have already been adapted, which rely on the imposition of virtual text, graphics and video on physical reality (Yuen et al., 2011). These technologies can use all sensors of the devices on which they operate, including location systems to determine position, locations and movement (Padel, 2009). As a result, virtual elements are superimposed on the existing world, complementing it and increasing the amount of information available.

This article will test the educational potential of one of the games designed for smartphone mobile devices – "Pokemon Go!". It uses the overlapping of virtual reality with physical reality and works on the basis of GPS location. An important aspect of the game under examination is its main subject. It is not an educational game. However, it has potential that can be used as an educational element. It is the possibility of visiting real locations, which may have their description and picture in the game.

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What exactly is "Pokemon Go!" game? The game takes advantage of the popularity of the animated series aired since 1997 entitled "Pokemon". The game was made available by Niantic in 2016, which already had experience in creating games based on geolocation, e.g. Ingress (Colley et al., 2017). It allows for the display of virtual pokemons in the real world and the use of real-world locations as part of the game – called PokeStops (Clark, Clark, 2016; Colley et al., 2017; Paavilainen et al., 2017) and Gyms, which have a similar but significantly expanded function. These places, called PokeStops or Gyms, will be the focus of the research described below.

PokeStops are points in the virtual world that are established in places of historical, sacred, sports, natural sites marked with a plaque or sign, cultural, important points of public transport and all others relevant to the local community (Niantic, 2020). PokeStops cannot be: educational establishments, private locations, places with no pedestrian access or dangerous, obstructing services, i.e. police and fire brigade, with variable location or time, without cultural importance (Niantic, 2020). For a location to become PokeStop, it must be reported by participants with high seniority. Once these locations are accepted by the community of players by voting, they become Pokestop (Niantic, 2020). What role does it play in the game? When it comes within its reach, the player displays a picture of the object, its name and any description, and the object itself becomes interactive. By activating the object, the player gains items to facilitate the game and additional tasks.

Gym is a marked location with PokeStop capabilities and additional functions. You can delegate your Pokemon there, which will accumulate the earned coins over time. No more than 50 coins can be accumulated. The Pokemon will also defend the Gym from other players who want to acquire this location and place their Pokemons there to collect coins. Occasionally there is an opportunity to take part in Raids in Gym in order to earn a unique Pokemon or to accomplish this task (Niantic, 2020).

The aim of this study is to determine if and what educational potential the game 'Pokemon Go!' has. For this purpose, the interaction of the players with the places marked as PokeStops will be investigated. The following research questions can be quoted: Q1: Do players show interest in the real locations marked as PokeStops or Gyms in the game? Q2: What is the level of interaction with real PokeStops or Gyms locations? Q3: Is there any interest in locations marked as PokeStops or Gyms after the game is over? All these questions will be addressed in relation to the chosen format of game use described in the next section.

2. Materials and methods

In order to obtain answers to the research questions asked, a three-stage research process was prepared. Each of the stages uses qualitative methods which have been selected in order to first get to know, then observe and finally understand the behaviour of the players and possible opportunities of using the game in education.

1) At the beginning, in order to be able to formulate research questions and design the study, an in-depth interview (Kvale, 2010; Creswell, 2013) was conducted with a person who has been playing "Pokemon Go!" for 4 years. (started in the year the game was launched on the market). This person was also responsible for introducing the researcher into the secrets of the game and explained the rules of the "Pokemon Go!" application. The effect of this stage was to prepare a selected format of game use and focus on the potential educational function of the PokeStops or Gyms visited.

2) After collecting 2 groups of players, a study was conducted to observe them (Łobocki, 2007). Researchers indicate that the most frequent number of people playing 'Pokemon Go!' in one group is 3-5 people (Colley et al., 2017), so there were 3 players in both studied groups. Both groups were examined in the same proposed format of game use. The format consists of observation of players on the route proposed by the researcher and prepared for the purpose of this study. Before the start of the study, the researcher determined the proposed route of the study, prepared maps with the route marked and prepared a list of places marked in the game as PokeStops and Gyms - 44 locations in total. Players were informed about the possibility of any change of route, shortening, extending or total change depending on their decisions. Both groups received printed maps. The suggested distance was 3.5 km and included a passage through the city and forest areas.

3) After each of the observations, the players received a questionnaire in which they defined their motivation and thoughts about the format of the game. The questions concerned the experiences and thoughts directly related to the time of the game, as well as the reflections that

followed. The open questions allowed for a better understanding of the motivation, behaviour and feelings of the players.

3. Discussion

So far it has been proven that “Pokemon Go!” has a positive impact on, among others, building human relations, promoting the region and improving the condition and thus the health of players (Althoff et al., 2016; Clark, 2016; Wagner-Greene et al., 2017; Rasche et al., 2017). Risks include problems with the privacy policy (Delello et al., 2018), payments made in the game and the possibility of physical injuries.

At the beginning of the discussion on the educational function of "Pokemon Go!" it should be noted that the game itself is not primarily an educational game, but can only perform such a function. The game uses the real world to place in it the fantastic realities of the plot known from the series "Pokemon" (Reeves et al., 2021). This article attempts to determine the level of the educational function based on a specific format of use of this application.

The game "Pokemon Go!" uses locations that are special, unique in terms of history, culture or because of their role in the local area. The possibilities offered by the game seem to suggest that this form could encourage and motivate players to visit and become familiar with the locations used by the game (Oleksy, Wnuk, 2017).

Researchers have also shown that during the game, not only interpersonal attachment may be created, but also players may feel attached to the place where they play (Oleksy, Wnuk, 2017; Woods, 2020). The use of "Pokemon Go!" in tourism can increase the positive experience of visiting a location. The players themselves show interest in using this game as a tourist guide (Aluri, 2017). The game "Pokemon Go!" seems to be a good tool for popularizing outdoor movement (Hamari, 2019), which defines the direction of using this application in tourism.

An area of great interest to researchers is the impact of "Pokemon Go!" on the physical activity and health of the players. Researchers have found that physical activity related to walking while gaming affects reducing noncommunicable diseases and impaired quality of life (Barbieri et al., 2017). This is because the game has an attractive form that encourages movement through play. It is seen as a new strategy to encourage people to a healthy lifestyle (LeBlanc, Chaput, 2017). There is also an immediate danger to the health or life of players. This danger is the careless movement in social communication and road traffic (Barbieri et al., 2017).

AR technologies are successfully used in education (Walker et al., 2017), e.g. in biology (Reeves, 2021), physics, mathematics, geometry (Lee, 2012) and history (Dejnak, 2012; Frania, 2017; Kęsy, 2017). The educational function can also be realized through mobile games using AR technologies (Molnar, 2018). There is a tendency to treat new technologies as an extension or supplement to traditional education (Frolova et al., 2018). It is noted that the use of an attractive visual form may increase the cognitive abilities of users, including students (Makarova, 2019). However, the challenge will be to involve and implement teachers in the proper and willing use of new technologies in education (Leahy et al., 2019).

The aim of this study is to determine if and what educational potential the game 'Pokemon Go!' has.

4. Results

The results of the study were divided into two subsections relating to the observation of the beginner group and the advanced group. The recorded observations come from observations of behaviours, actions taken on smartphones, dialogues heard and conclusions formulated on the basis of questionnaires sent to the respondents after the observation. Declarations and opinions of the participants were formulated on the basis of messages collected orally (during the observation) or sent through a form after the observation.

Beginner group

The beginner group, starting the game on a certain route, had no experience in the game "Pokemon Go!". Those who took part in the group described as "beginners" belonged to one group of friends. From the very beginning the main topic of conversation was private and professional life. The conversations did not concern individual places marked as PokeStops or Gyms.

During the walk, the main focus was on learning the secrets of the game and catching Pokemons. The game "Pokemon Go!" itself turned out to be very interesting for the beginner group, they treated it as a one-time entertainment whose main goal was to spend time with friends.

During the game there was a competition to catch a particular Pokemon or another time to discover a new feature of the game. There were unsuccessful attempts to confront the captured Pokemons. Catching new and new Pokemons became the main activity performed by players. The participants of the study, learning the possibilities of playing "Pokemon Go!", tried the possibility of catching Pokemons using AR. They decided that switching off the AR allows for easier catching of Pokemons, therefore, despite its more attractive form, they preferred not to use it. The activities performed in the game required players to concentrate. Sometimes, with bigger challenges, they stopped for a while and concentrated on activities such as catching Pokemon. The game was so addictive that there was an incident affecting the safety of players – they entered the pedestrian crossing at a red light.

The players went through part of the planned route according to the proposal marked by the researcher on the map. However, they decided to shorten the final section. After the end of the route they did not stop playing, still treating the game as a form of fun. They described the route as too long. They declared that they would prefer to focus on a shorter route or a smaller area which would allow them to take advantage of the game.

Beginner players clearly noticed the difference when changing from urban to forest environment. First of all, they experienced fewer PokeStops and Gyms. They felt a decrease in the possible interactions offered by the game. They also devoted more time to one of the Gyms located at some distance from the proposed route in the forest section – the historic Old Collector Fan. Despite devoting the most time to it, they did not try to find it in the real world, but only used it in the game environment.

Throughout the study, interaction with locations marked as Pokestops or Gyms was limited to interaction in the virtual world. Occasionally, there were moments of looking for them in the real world, as declared by the players themselves. None of the locations have aroused such curiosity as to make players devote their time outside the game.

Advanced group

The members of the advanced group, like the beginner, knew each other before. In this case, the basis for their acquaintance was a joint game of "Pokemon Go!". Before, during and after the tour, the main topics discussed by the participants were the events related to the game elements. During the interviews they used specialist terms related to the game and shared their experiences and plans of developing their achievements in the game world. The players focused on recalling achievements from the past, which may be regarded as outstanding or exceptional in the reality of the game. None of the players took advantage of the additional opportunities offered by AR.

During the walk, players focused on aspects of the game concerning catching Pokemons, virtual interaction with PokeStops and Gyms, performing tasks, hatching eggs (hatching takes place by passing a certain distance). The skills of the game were noticeably higher than in the case of the beginner group. They allowed for faster and more efficient use of the application. These activities seemed to be trained to such an extent that they were probably performed reflexively, in the shortest possible time. This reduced the time of interaction, also with locations marked as PokeStops and Gyms.

The players went through the whole proposed route. They described the distance covered as short in relation to the distances covered during the regular game. The optimal area for the game was indicated as having a large number of PokeStops or Gyms and acting as a respawn for the unique Pokemon type. The desired area would be a short looped route, which could be travelled many times in order to maximise the profit in the game and reuse the elements of the game that occur in high density.

Advanced players have negatively assessed the forest space of the proposed route. It did not allow for quick replenishment of items necessary to catch Pokemons – such a feature is offered by PokeStops or Gyms. One player used one of the Gyms (Old Collector Fan) to place Pokemon in it. He was accentuated by a lack of professionalism by choosing an inefficient Gym. It was noticed that this is probably a rarely visited place, so Pokemon will not return to the owner quickly after collecting the maximum amount of coins. The result was that he would not be able to use these resources quickly. What is important, however, is that it is the only Pokestop or Gym that players have sought information about on the Internet after completing their route.

The study did not observe any physical interaction in the real world with the locations marked in the game as PokeStops or Gyms. Similarly to the beginners, the advanced group did not look for physical locations marked in the game, including those distant from the proposed route,

such as the Old Collector Fan. One of the players, when passing one of PokeStops located in Academy of Physical Education in Warsaw, associated that he had already been there before. The association was made because this place was already marked as visited in the game. Moreover, he remembered that together with a friend, they had caught a certain type of Pokemon in this place in the past.

Players of both studied groups paid attention to pictures of locations marked as Pokestops or Gyms placed in the application. They also got acquainted with their names. They pointed out that in most of the locations there was no exhaustive or even basic description supplementing the name. They assessed that it would significantly increase the possibility of gaining knowledge about the visited places. However, not every location was of interest to players. They declared that they would have demonstrated a greater commitment to learning about the places placed in the game if they were unique, visually appealing and unusual. The locations on the proposed route did not meet these expectations in their opinion.

5. Conclusion

The game "Pokemon Go!" does not lose its popularity. Its creators adapted it to the requirements related to the covid-19 epidemic. Thanks to this, this mobile game is still gaining new players, which translates into higher and higher income of its creators (km, 2020).

Many researchers emphasize the positive effect of the application on physical health and increasing motivation to exercise outdoors (Althoff et al., 2016). However, this does not have to be the only advantage of the game. The game has the potential to use its attractive form as an educational tool (Dejnaka, 2012). This is facilitated by the use of geolocation, which allows interaction with real areas or objects in the real world. It can become a tool for tourism or education (Frania, 2017). It can also be used to promote the region by local communities.

After the survey, it is not possible to clearly determine the optimal way to use the game "Pokemon Go!" for educational purposes. This study can be treated as a pilot – looking for answers to research questions that were asked while observing a specific format of using the application. As the next stage of the research, it is planned to use the format proposed by the players. In order to increase the educational dimensions of the game, it is necessary to consider the area more saturated with game elements and more attractive in terms of tourist attractions. It should also be clarified what is the impact of the quality level of location descriptions on the level of obtaining information about the place visited. Pokestops or Gyms descriptions are created and accepted by the players themselves, who have reached a maximum level of – 40 in the game. This aspect of responsibility for the educational dimension of the game therefore lies with the community of players who have the opportunity to contribute to the content of the game.

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