Using a Training Game to Habitualize Staying in a Laboratory

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Abstract

The purpose of this study is to support the user to visit the laboratory and increase the staying time. Visiting laboratory has some advantage for new student to interact with seniors and clarify the research goals. However, laboratory is a place hard to visit voluntarily for new students because of high psychological cost. Therefore, it is important for students to visit by themselves and stay in their laboratory. In this paper, we implemented a training game application for smartphones. This application is designed as a game in which the character grows according to the staying time of the laboratory. This aims to motivate users to visit the laboratory and extend their staying time.

Keywords: Procrastination, Beacon, Application, Gamification

1 Introduction

University students need to submit a thesis for graduation. They write a graduation thesis in the laboratory that they belong to. An inexperienced student often underestimates the time required to complete a task and thus fails to accomplish it as planned. Thus, the research results do not increase more than expected. Such behavior is called procrastination[1]. Students often postpone doing their tasks; they prioritize going home or playing with friends. For example, suppose that a student has to choose between going to the laboratory or playing with a friend. He or she will generally not choose to go to the laboratory. This is because people find it difficult to make choices that are psychologically costly. For many students, going to the laboratory has a high psychological cost and thus is hard to choose. However, if a student keeps avoiding visiting the laboratory, the task cannot be accomplished. Therefore, it is necessary to encourage students to go to the laboratory with their own will.In this research, we explored ways of encouraging students to visit the laboratory. We used the concept of gamification to amplify the attractiveness of the laboratory. We assumed that the accomplishment of a task and time in the laboratory are related. We implemented a breeding game as a mobile application to prompt the student to stay in the laboratory.

2 Previous research

In previous research on behavior change, Wakao et al developed an application called “Tekupico” [2]. This application is used in a shopping mall, and its purpose is to encourage users to visit places they usually would not. Tekupico coordinates between a smartphone and Bluetooth Low Energy (BLE). The user plays a game at the destination to get a stamp. Shimada et al developed a game comprising an activity quantity visualization system aimed at fostering compassion among families [4]. The system displays a family as an avatar. The user progresses through the stages of the game based on the amount of activity of each family member. The aim of the system is to help users enjoy these activities and continue to use the system because they think that it is fun.

3 Application design

We designed the application to mitigate the user’s psychological burden. The purpose of this study was to direct the user to the laboratory and increase the staying time. If the user thinks it is fun to come to the laboratory, he or she will actively visit it. Thus, we focused on “gamification[3]”, which is using game design to motivate the user to accomplish a task and thus encourages the user to actively solve problems. In

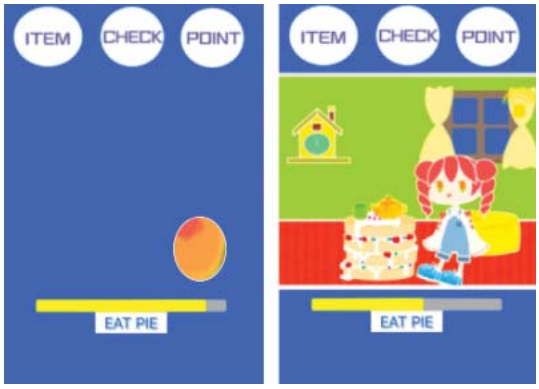

Figure 1. Application Image.

this study, we developed a breeding game application where the user ' s behavior is associated with the act of voluntarily visiting the laboratory. The breeding game has the following elements: 1. The user feels like he or she is breeding a character. 2. The user has fun when playing the breeding game. 3. When the user presses a button, he or she actually feels like they are breeding the character. The above three elements are important. For the first element, users gain points to breed a character from an egg. The character has a physical fitness gauge. The user can recover items to buy points to refill this gauge. Several characters are available for users to breed. For the second element, the user collects objects such as furniture. These objects are used to decorate the space where the character exists. The user is randomly granted an object at first. The object can later be changed to one more to the user ' s liking. For the third element, the application displays the user ' s operation status with a pop-up-message. This is displayed when the user collects an object and takes care of the character.

4 User entry confirmation method

A beacon is used as a trigger for application processing. The beacon is a BLE machine. The beacon uses Bluetooth to send a signal to BLE-compatible equipment (i.e., a smartphone). The beacon gives location information. If more than one beacon is installed, the smartphone can determine the location based on the beacon signal that is received. The difference between the beacon and GPS is that the former is more accurate for indoor observations. In addition, the beacon body can be installed in any location. The beacon is also better for measuring the position at short distances. The beacon we used in this study can communicate with a radius of about 30 m. One beacon can cover an entire laboratory. A beacon was installed in a laboratory, and the application was developed to search for the beacon.

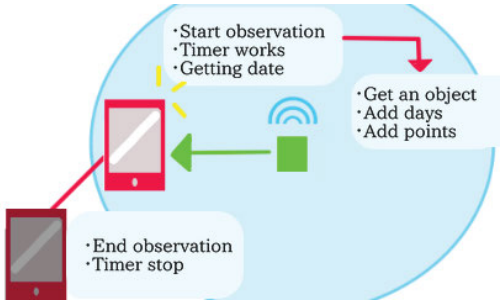

Figure 2. User entry confirmation method.

5 Implementation

We developed a breeding game called " Login MAT, " which is offered as an iPhone application. A similar process is performed in the background. The user needs to set the iPhone to Bluetooth mode before starting the game. When the system observes the beacon, it starts counting the visit times. The system then generates an event at regular time intervals. This process only works in the beacon region and give points every 5 min. The points are mainly used to grow the character. They can also be used to change the characters and collect objects such as furniture. When a user first gets an object, the date is recorded. The application then compares the current and previous dates. If the date is different, the system adds days. The user is randomly granted six kinds of objects depending on the number of days added. To clear the game, the user has to collect all of the objects and raise the character. The user can then use the accumulated points to buy other objects or change the character.

6 Methods

An experiment was carried out to verify that useful data can be obtained accurately. Participants were five people with iPhones. The test period was two weeks.

7 Results

The results are shown in Table1.

Table 1. The experiment results.

Participants	Days	Days before the experiment	Time(min)	Points	Character change
A	4	2	70	210	2
B	4	4	295	885	6
C	5	5	1500	4500	41
D	4	2	275	825	6
E	No data	0	No data	No data	No data

8 Discussion

Based on this experiment we verified the usefulness of the application for suppressing procrastination. First, we considered whether the user enjoyed the application for its usefulness. We did this by counting the character changes. Character changes are not done automatically and thus can be used as an indicator that the user enjoyed the application. A character can be changed in exchange for 100 points. The experimental results showed that users changed the character in proportion to the income points. This implies that the user made changes in order to see the character. We can use this to conclude that the user enjoyed the application. Next, we considered the suppression of procrastination. We chose "Days" and "Days before the experiment" are parameters. The results showed effects for two students but not others. These students came to the laboratory before the experiment. Student E did not show up for even 1 day. Thus, it cannot be concluded that procrastination was suppressed.

9 Conclusion

This research applied a breeding game to prompt users to stay in the laboratory. The implemented system adopts the approach of gamification. The aim was to motivate users to actively visit and stay for some time in the laboratory. The experiment showed that the game provided added value. However, it cannot be concluded that procrastination was suppressed. We need to review the design guidelines again and review the data. We will continue experiments with students newly attached to the laboratory in the future.

References

[1] Clarry H.Lay: At Last My Research Article on Peocrastination, Journal of Research in Personality, Vol. 20, pp. 474–495 (1986).

[2] A. Wakao, K. Matsumura, M Suzuki, H. Noma,: Treasure hunt game to persuade visitors to walk around a shopping mall, IEEE 4th Global Conference on Consumer Electronics (GCCE),pp.527–530 (2015).

[3] Deterding, S., Dixon, D., Khaled, R. and Nacke, L.: From Game Design Elements to Gamefulness: Defining "gamification," *Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments*, pp. 9-15 (2011).

[4] Sayaka Shimada and Mitsunori Matsushita,: Evaluation of Communication Tools to Encourage Caring Gestures towards Family Members, *Proc. 5th International Congress on Advanced Applied Informatics*, pp. 119-122 (2016).