

# Potential Contribution to Food Education of A Digital Cooking Game Using Tangible User Interface

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## Abstract

We think that ambient intelligence can expand playing house is one of the most popular play for young children. Therefore, we developed a prototype of cooking application for iPad. And we adopted Tangiblock invented by Benesse Corporation as natural user interface. For cooking, users tap and rub a screen of the iPad with the ingredient and tool blocks. After that, a dish will be completed and the kind of dish decided automatically by combination of blocks. To make the user imagine eating the dish, we used an appetizing picture to express the dish. And we provided a recipe of the dish too, if they want to make it for real. As a result of observation, the game seemed able to attract children's interest in food, and we have think ambient intelligence has the potential to contribute to food education.

## Introduction

Combining the digital and the physical worlds to create a superior in-store shopping experience is one of important topics for us as marketers. We found Tangiblock that was invented by Benesse Corporation during the study of Ambient Intelligence Technology. Since Tangiblock is a new unique digital interface with a real block, we had been extremely interested in that. In the process, which considers utilization method of Tangiblock, we thought it be able to expand playing house that is one of the most popular play for young children. Therefore, we developed a prototype of cooking application for iPad.

## Description of the Application

To play the application, user needs several real blocks that have functions of ingredients and tools. First, user chooses the ingredient block and taps them on a frying pan (or a pot) displayed on the screen. So a picture of the ingredient is displayed on the same position tapped on the frying pan

(or the pot). Next, user rubs the screen with the tool block (e.g. spatula, ladle) a little time. After that, a dish will be completed and the kind of dish decided automatically by combination of blocks. To make the user imagine eating the dish, we used an appetizing picture to express the dish. When user taps with the spoon block on the dish it gradually disappears and user can pretend to eat it. In addition, user can display the information of the dish and the recipe to cook really by tapping with the recipe block, and so they can eat it really not only play.

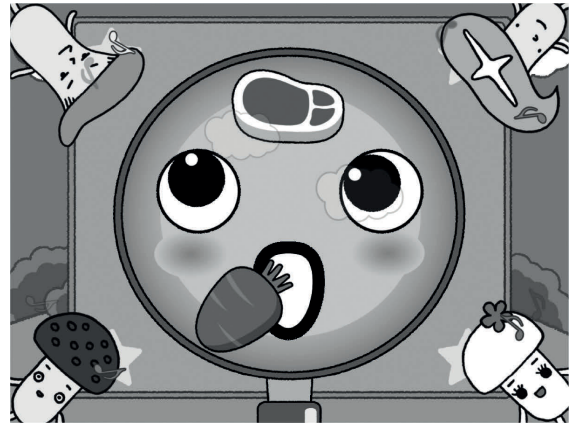


Figure 1: the Screen of the Application.



Figure 2: the Blocks of ingredient and tool.

## Mechanism of Tangiblock

iPad adopts a capacitive touch screen. When user touches the screen with a finger, the touch is recognized by a change in electric current. The black part of Tangiblock is made of a material that conducts electricity, and it has four projections on the bottom. When user puts it on the screen while touching the black part, it is recognized as touch. Because of the positional relationship between the four locations, applications can identify the type and angle, and the center position of Tangiblock.



*Figure 3: the Shape of Tangiblock.*

## Feedback from users

The target age of the application is 3 years old. To make this application more attractive, we had 16 children from 0 to 7 years old experience the prototype as test, and improved it. In order to perform the test more naturally, we asked the parents of the children to shoot a video while playing in their home. Result of observation through the video, our application was not only for playing, but also we was able to see the possibility that lead to real food education.

An infant of 3 years old, after making a mushroom cuisine in the app, she really takes a mushroom from the refrigerator and smells it.

The oldest 7 years old girl tried to devise a combination of foods to make a dish she wanted.

And a 2 years old boy played in the app for 30 minutes, he felt really hungry to look at the picture of the food, and finished the app himself, and went towards the kitchen to take a dinner.

## Conclusion

Traditional playing house is only a fantasy on the play. However, the reality of playing house increases by this application, and we would be able to make interest and opportunity of understanding about food. Through the study that how to use Tangiblock to food education, we found a possibility to lead users to food education besides playing. With using Tangiblock practically, user will be

able to get opportunity for more sophisticated food education. For example, user can get information of food nutrients or recipes with Tangiblock. In the future, by the addition of the same mechanism as Tangiblock with electrostatic inks for food packaging, user can get information such as direct nutrients and recipes from food in grocery or refrigerator. And children would be able to play with real food.