

# Development of Digital Game-Based Learning System in Social Curriculums of Primary Schools

Yu-Chuan Chang

Department of Digital Humanities,  
Aletheia University,  
New Taipei City, Taiwan  
a86m12y25@gmail.com

Kai-Yi Chin

Department of Digital Humanities,  
Aletheia University,  
New Taipei City, Taiwan  
au0292@mail.au.edu.tw

Hsiang-Chin Hsieh

Institute for Information Industry,  
Taipei City, Taiwan  
palapala@iii.org.tw

**Abstract**—With the advances in science and technology, it has been a new trend to apply digital game-based learning in education. Although many scholars have proposed digital game-based learning systems, less attention has been paid to their development in social curriculums. However, in the teaching of social curriculums, it often needs to construct cultural backgrounds of many different countries as well as different story backgrounds. It is not only abstract but also difficult for teachers to use only films or use films plus photographs for lecturing, but will also make learners easily lose confidence in learning. Therefore, this study establishes a digital game-based learning system included Map module, Guidance module, Story module, Question module, Learning process module, Scoring module, and Feedback module. This system uses the first person perspective in the game and guides the learning of learners in the way of passing game levels. It is expected that this system can be used as a teaching aid for learners to learn in the game, thereby achieving the effect of teaching in fun.

**Keywords**—Digital Game-Based Learning, Multimedia Technology, Social Curriculums.

## I. INTRODUCTION

With the progress of digital technology, scholars begin to think about whether the traditional learning mode does not meet the needs of the present era [1]. In the traditional learning mode, students will passively absorb the knowledge imparted by teachers. This one-sided way of teaching will make students lose the ability of independent thinking and the interest in learning [2]. In other words, when teachers are at the dominant position while learners are at the position of passively receiving information, it will not only dramatically reduce individual learners' learning effectiveness, but also make learners lose interest in learning and reduce learning effectiveness [3].

In recent years, in order to improve the disadvantage that traditional learning cannot arouse learners' motivation, many scholars began to introduce games into the learning field. For example, scholar [4] believed that games can drive learners' learning motivation, while learning motivation is closely related to learning effectiveness, as learners' learning effectiveness will be affected by the degree of learning motivation. It is also pointed out in the paper Cai, You and Xiao [5] that game-based learning can solve the shortcomings of traditional learning that it cannot attract learners' motivation. Therefore, incorporating games into learning situations can

not only induce learners' learning motivation, but also achieve the goal of improving learning effectiveness.

At present, many scholars have integrated games into the educational situation through multimedia technology, and put forward relevant game-based learning systems. For example, [1] initiated the digital game-based learning mode that combines the traditional learning mode with multimedia technology. He found that game-based learning combined with multimedia pictures could add fun to the learning process. When the learning process is fun, it will induce learners' learning motivation and make them willing to take the initiative to learn. When the learners' learning motivation improves, their learning effect will also improve [1] [6].

Although many scholars have proposed digital game-based learning system similar to the above ones, and their systems usually are applied in mathematics, Chinese, natural science and English teaching domains [7], yet some scholars believe that there is less emphasis on the social curriculums such as history or geography [8]. However, in teaching these curriculums, it is often necessary to construct teaching context of cultural backgrounds of many different countries or with different story backgrounds and teachers usually can only improve learners' understanding by means of film or photo explanations. However, it is not only abstract but also difficult to imagine the pictures of different periods and the changes of different centuries based on the information of these fragments, but will make learners lose confidence in their learning and feel frustrated [9].

Based on the above illustration, this study develops a learning system that combines multimedia technology and game mechanism, with the curriculum content of Taiwan in the era of great voyage as the main axis and Dr. Mackay as the first person perspective. It introduces Tamsui's geographical location, historical background, architectural style and historical stories through the game-based way of walking through Tamsui's history and geography. Moreover, the proposed system also has seven modules that can support students to learn and reviewing the corresponding learning materials, and further to challenge the questions about the stories of this land of Tamsui. In this kind of immersive game environment, primary school students can naturally learn the knowledge imparted in the game because of the plot in the game, thus improving their learning motivation and willingness to take the initiative to learn, thereby achieving better learning effectiveness.

## II. CONTEXT OF THE DIGITAL GAME

This project expects to use RPG Maker MV, the software developed by Enterbrain Incorporation, to design a digital game-based learning system that walks in the history of Tamsui, and take Dr. Mackay as the first person perspective in the game. This paper will introduce the system by dividing it into two parts: the teaching guidance function and the competition interaction function.

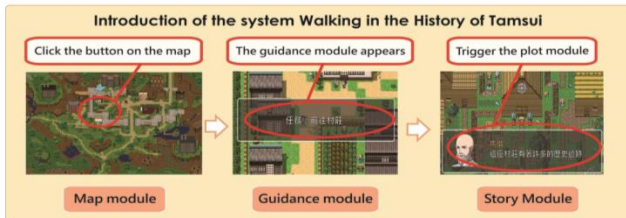


Figure 1. Introduction of Teaching Guidance Function

Figure 1 shows the teaching guidance function, i.e., beginning to enter the game. This part includes three module functions, which are described as below:

- Map module: In this module function, learners can select icons on the map to choose the game level they want to play.
- Guidance module: Guiding learners about the tasks and objectives that must be achieved in the process of the game play.
- Story module: Introduce the stories about the area in the game, including the geographical environment, historical background, architectural style and so on.

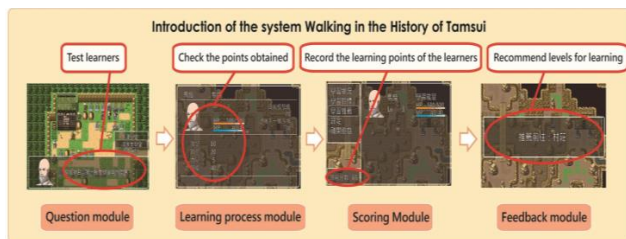


Figure 2. Introduction of Competition Interaction Function

Figure 2 is the competition interaction function that means the competition mechanism. There are four kinds of module functions in this part, which are described as below:

- Question module: The learner can answer the test questions. If the answer is correct, he can get scores and then go to the next level. Otherwise he will lose scores and stay at the current level until passing the test before reaching the next level.
- Learning process module: In this interface, learners can view the scores obtained and the learning status.
- Scoring module: Record learners' scores in learning.
- Feedback module: Recommend the next level suitable for the learners according to their learning status.

## III. A PROPOSAL FOR FUTURE WORK

This study establishes a digital game-based learning system named Walking in the History of Tamsui which takes Dr. Mackay as the first person perspective in the game and is applied to the teaching activities in social curriculums. It is hoped that this system can break through the traditional learning methods in the past and reflect teaching effect brought by the digital game-based learning method through the interesting nature of digital game-based learning itself so as to make teachers willing to use this teaching method on their own initiative, thereby expanding the development of digital game learning systems.

However, this study is still at the stage of system testing, and there is no substantial teaching effect to prove the contribution of this study. Therefore, in the future, this study will use pre-test, post-test, questionnaire and interview methods to understand the impact of game-based learning system on primary school children's learning of social curriculums and compare it with the traditional learning methods. Meanwhile, this study will also explore whether primary school children can improve their learning motivation and thus have changes in their learning effectiveness because of the development of game-based learning.

### ACKNOWLEDGMENT

This work was supported by Ministry of Science and Technology of Taiwan under the grant number MOST 107-2511-H-156-001.

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