

Educational Game Design and Application based on Deep Learning Mode

Xiaowei Qian

University of Baguio, General Luna Road, Baguio, 2600, Philippines

Abstract

Based on the theory of deep learning, this paper aims at the problem of how to stimulate, maintain and strengthen the user's learning motivation, establishes the corresponding game design model, puts forward the motivation and maintenance strategy based on the model, develops educational games and carries on the practice in higher vocational classes. The results show that the use of educational games can effectively promote students to transfer the knowledge, skills and emotions acquired in the game to the outside of the game, and then continuously review, reflect on the results of self-construction, learn from the past and learn from the new, and solve problems creatively.

Keywords

Deep Learning Mode; Education Game; Learning Motivation.

1. Introduction

In the era of "Internet +" education, information technology has been deeply integrated into the whole process of education, giving birth to a new teaching mode and curriculum form. SPOC has become a new form of education and teaching reform. However, information-based learning exists.

Fast food, fragmentation, miniaturization and shallow reading map, learners lack learning motivation, lack of deep learning, poor learning effect and other disadvantages. The horizon report: 2016 higher education edition to deep learning as the acceleration of higher education the key to the technology adoption trend, the horizon report: 2017 higher education edition is mentioned in terms of the trend of higher education technology application in China, is by the traditional way of learning, learning space to creative learning and deep learning. In recent years, educational games are one of the hot spots in the research on the combination of information technology and education. People try to guide students through the combination of games and education, deepen the effect of teaching and learning, enhance students' subjective learning motivation, and move towards deep learning. This study attempts to establish an educational game design model under the guidance of deep learning theory, and tries to solve the problem of using games to stimulate students' learning motivation and transfer the knowledge, skills and emotions acquired in games to the outside of games.

2. Deep Learning Theory and its Application

2.1. Concept of Deep Learning

Ference Marton and Roger Saljo (1976) (Essential Differences in Learning) In the article results and Process, the concept of "deep learning" was proposed for the first time in relatively shallow learning, emphasizing that deep learning means that learners learn actively and can flexibly and skillfully use the new knowledge to solve practical problems. [1] Subsequently, Ramsden, Entwistle and Biggs enriched the theory from definitions, connotations, strategies, models and other aspects. Professor Li Jiahou, a Chinese scholar, believes that deep learning refers to learning in which learners critically learn new knowledge on the basis of understanding and

integrate it into the original knowledge structure, so as to transfer the knowledge they have learned to new situations and solve new problems. [2] In addition, zhang Hao, Yu Shengquan and other scholars have also defined deep learning with different focuses, but the conclusions tend to be consistent. It is generally believed that deep learning is an active and critical way of learning and an effective way to achieve meaningful learning.

2.2. Characteristics of Deep Learning

2.2.1. Critical Understanding of Knowledge Learning

Deep learning is a kind of learning based on understanding. It emphasizes that there is no absolutely correct knowledge. It is necessary to be good at questioning and discriminating on the basis of understanding things, and deepen the understanding of deep knowledge and complex concepts through questioning and discriminating.

2.2.2. Organic Integration of Learning Content

The integration of subject knowledge and the connection of old and new knowledge in the used learning process. It emphasizes the effective integration of activated prior knowledge and acquired new knowledge.

2.2.3. Constructional Reflection of Learning Process

Constructional reflection refers to the process in which learners assimilate and adapt knowledge, adjust original cognitive structure, and examine, analyze and adjust the results of construction through the two-way interaction between new and old experiences on the basis of knowledge integration. This not only requires learners to actively understand and judge new knowledge, but also to analyze, identify and evaluate new concepts, principles or problems with their original knowledge and experience, so as to form their own understanding of knowledge and construct new knowledge sequence. Moreover, it is necessary to constantly examine, reflect on the results of self-construction and learn from the past, so as to form a proactive examination, evaluation, regulation and transformation of learning.

2.2.4. Pay Attention to the Transfer and Application of Learning and Problem Solving

Deep learning requires learners to have a deep understanding of learning situations, judge and grasp key elements, and be able to draw inferences from one another in similar situations. I can also analyze and judge differences in new situations and transfer principles and ideas to apply. Another important goal of deep learning is to solve real problems creatively, that is, we are required to use principles to analyze problems and solve problems creatively.

3. Analysis of Teaching Status of Photoshop Course in Higher Vocational Colleges

3.1. Knowledge Analysis of Photoshop Course in Higher Vocational Colleges

Photoshop is a powerful image processing software, rich in content, relatively many tools, according to the way of learning can be divided into its knowledge points memory and operation type. Among them, path and layer application of operation type, filter of memory type and image color and tone adjustment, channel and mask of analysis type are the key and difficult points in learning, and their commands have their own characteristics. Now, filter is selected for analysis.

3.1.1. Filter Features: Simple Operation, Wide Variety and Powerful Functions

Filter in Photoshop is a plug-in module that can change the pixel or color of an image to make ordinary pictures into various special effects and beautiful visual works. The Photoshop Filter menu offers more than one hundred filters, of which "Filter Library", "Liquefy" and "Vanishing Point" are special filters. The other filters are grouped into different filter groups based on their main function. The filter is easy to use, just execute the command from the menu. But because

of the variety, it's hard to really use it in the right place. If you want to apply filters in a targeted way, in addition to the usual art foundation, the most important thing is that students also need to have a very strong memory of filter effects.

3.1.2. Path Features: Complex Operation, Difficult to Get Started, and Accurate Selection

A path in Photoshop is a closed or open segment of a curve using a Bezier curve. The starting and ending points of a line segment are marked by anchor points, and the shape of the path can be changed by editing the anchor points of the path. Control curvature and direction by dragging bezier lever. Paths are very versatile, not only for drawing smooth curves, but also for creating and modifying complex selections with great precision. But for novices, the use speed is slow, can not accurately judge its tracing point.

3.2. Problems in Teaching

3.2.1. Contradiction between Teaching Carrier and Students' Interest and Demand

At present, Photoshop teaching methods mainly include traditional teaching method, task-driven method and case teaching method. The traditional teaching method is that the teacher explains the basic theory of Photoshop first and adds examples at last. Task-driven method is to guide students from simple to complex, from easy to difficult, step by step to complete a series of "tasks", synchronous training of picture processing ability; The law of case teaching is to start with actual cases, decompose knowledge points, and explain different knowledge points with the help of different examples [1, 2]. The above teaching methods have diversified forms, but the teaching carriers are relatively single. The main forms are still symbolic information carriers such as pictures, images and language expression, and activity carriers such as acquiring skills through participating in and completing projects. However, in reality, students' interest needs are games, and the three teaching carriers mentioned above fail to synchronize with students' game needs.

3.2.2. Contradiction between Supply of Class Hours and Demand for Mastery

Large departments of higher vocational colleges will be this course in the first or second semester, the arrangement of limited class hours, generally in 40 ~ 60 class hours. The course requires students to be able to master the basic tool operation method, on the basis of professional creation or production. For architecture majors, it is necessary to make comprehensive use of relevant tools to make the color plan of the building interior suite, make the color plan of the outdoor general plane, and process the effect map of the outdoor building. However, due to the limited schedule of class hours, students often ignore the basic accumulation and do not have the endurance to operate the basic tool repeatedly, leading to many students can only apply but not master, let alone skillfully use it to create works.

Therefore, there is an urgent need to reform the repeated practice of basic commands through examples, which can be combined with games to make the operation of repeating basic commands that students think boring become a key problem in the game, and learning becomes a happy thing. In the process of the game, students should memorize and master the functions, usages and effects of common commands, lay a solid foundation step by step, and then form the knowledge into self-understanding, internalization, construction of new knowledge sequence, and finally make flexible application.

4. Educational Game Design based on Deep Learning Mode

4.1. Model Construction

According to the theory of deep learning, to arouse students' learning motivation, first arouse students' interest; Then let the students understand the task content, stimulate the students'

confidence in learning, and finally let the students feel the sense of achievement after completing the task. Therefore, in the design of educational games, first of all, it is necessary to analyze the characteristics of the objects used in games and the characteristics of the learning content required to master, and select the types of games that students are interested in. Then, find the meeting point between the content and the game, and correspond the teaching content to the key points of the game; Finally, game development, application and optimization.

4.2. Model Application

4.2.1. Game Type Matching

According to the survey, QQ games are favored by vocational college students at present [5]. There are many QQ games, such as "Fight the landlord", "Lianlianzhan", "Beauty find faults", "Four Military flags" and "QQ Farm". This kind of game has a short game time and relatively simple operation, so users pay more attention to the operation skills of scenes or characters in the process of using the game products. Therefore, in the design of educational games, such light and short exquisite games are also the main types, which are quick and time-consuming for students, so that students do not need to spend time to get familiar with the rules of the game, and they can use the spare time after class to review the relevant skills of the course. After analysis, for, filter effect memory design "PS special effects flip and change to see" game.

4.2.2. Educational Game Design -- "PS Special Effects Flip and Change"

The purpose of this game design is to let students memorize many commonly used filters in PS through the game with the help of flip card puzzle games. Game according to the differences of student ability levels are divided into basic and prestige, edition of basic version for players ability level for a single filter effects have a vague impression or basically can only identify a single common filter effects, so the game interface set images into a single filter application effect of all pictures, let the students to match. In the advanced version, students are required to analyze the situation of poor comprehensive application ability of multiple filters. The game entry interface provides an original image and a target image, which are respectively the effect pictures before and after the application of filters, allowing players to restore and sort the filters used in the picture (as shown in Fig. 1 and 2).



Figure 1. Basic level interface design



Figure 2. Advanced level interface design and level help Settings

Basic version - PS special effects flip card: each level of the game pictures are placed down, players click on two each time, if the two pictures are the same filter effect, it belongs to a pair, the pictures are paired successfully, their position automatically shows the name of the used filter, if the two pictures are not the same filter effect will be covered back. Until all images are matched, the game is over. This game can also be played by two people, each person turns over the picture once, if there is a pair, continue, there is no pair, the other person turns over the picture, the person who turns over the picture with the most logarithms wins. In this process, students can strengthen their memory of the effect of a single filter after processing, and let students remember more filter effects virtually.

Advanced version - PS special effects change look: the game to the player's ability to higher requirements, mainly rely on students to multiple filter comprehensive use of analysis ability to enter the level. The game requires players to restore the multiple filter application steps given the picture in a specified time. During this process, the player clicks the corresponding button in the processing step to display the specific setting parameters of this step. Through this game, players can be trained to analyze the filters used in the processing process from a final result graph.

5. Education Game Application and Effect Survey

5.1. Game Application

Educational games can be integrated with classroom teaching, practice after class and exploration after class, and become an effective new carrier for teachers' teaching. In classroom teaching, educational games can be used as a carrier to run through the whole link of corresponding knowledge teaching. In the process of teaching, teaching games can effectively guide students to learn, and games can be used to master skills in the process of learning. For example, in the game "PS special effects flip cards and change to see", teachers only teach and demonstrate basic commands and operations, while more complex and diversified mirror effects allow students to learn and memorize by themselves through the game. Thus, it can smoothly realize the transformation from teaching to learning, and from classroom to the combination of both inside and outside the class. In the practice after class, educational games can become a channel for students to expand their extracurricular training. Teachers according to students' ability to recruit, after-school homework assignments to game to let the students to classroom learning command and skills as the foundation, as the game goes on to consolidate classroom knowledge, through the accumulation of play experience consolidate classroom knowledge, obtain a new ability, and on the basis of this new capability, to continue the game stage mode, make the teaching to grasp the content, skills, form a cyclic process.

5.2. Game Application Effect Survey

The game teaching of this project is applied in six classes of product Art Design major (1901, 2001, 2101) and Architectural Decoration (1901, 2001, 2101) respectively. The parallel class adopts traditional teaching methods as the control class. And at the end of the course, the experimental class game satisfaction, learning effect and other educational game application effect survey. (See Table 1 educational Game Application Effect Survey).

The survey results show that the students highly approve of the implementation of game education in this project. They think that the weak points in the screen command are designed into the games they are familiar with, which can arouse their great interest and is very conducive to their memory of the effect of the screen. Using the game level generator can create a new game interface, can stimulate the creation of other mirror effects of interest, very fulfilling.

Table 1. Educational Game Application Effect Survey

category	The survey	Points
Game Satisfaction	The overall impression	1-10
	The game	1-10
	The graphics	1-10
	Effect of music	1-10
Learning effect	The difficulty of the level	1-10
	Whether knowledge has been learned	1-10
Knowledge presentation	Whether knowledge is presented naturally	1-10
	Depression during the game	1-10
Interest in game teaching methods	Whether they have improved their interest in learning	1-10
	Whether you like this way of learning	1-10
	Whether or not this learning style is expected to be applied to which subjects	

6. Conclusion

Based on the four characteristics of deep learning theory, this paper establishes a corresponding game design model for how to stimulate, maintain and strengthen the learning motivation of users, and carries out the actual development and application of educational games in the course of Photoshop, and verifies the feasibility and effectiveness of this model through investigation and application research. In the follow-up study, we will develop practical educational games with a larger scope and more teaching contents based on this model, and create more educational games that really interest learners through continuous improvement in practice.

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