Construction of Electronic Educational Game Design Pattern Based on Feature Extraction Technology

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Abstract. With the popularity of computer and Internet, online games and educational games have become very common forms of entertainment in our daily life. Especially for teenagers, all kinds of games have become an indispensable part of their extracurricular activities. The emergence of Educational Games brings entertainment and interest to students' boring learning, which can realize the change of students from tired of learning to willing to learn. Its purpose is to stimulate learners' interest in learning and promote learners' autonomous learning. Whether the design of educational games matches the characteristics of learners is the key factor to determine the success of educational game design. The design of educational games must be based on the characteristics of learners. Based on the feature extraction technology, this paper analyzes the construction method of the design pattern of electronic educational games, strives to balance the educational and game nature of electronic educational games in the design program, and provides a new idea for the construction of teaching resource database.

Keywords: Educational games; feature extraction; resource library

1. Introduction

Video games have gone through nearly 40 years. As one of the mainstream entertainment industries, the game industry is always on the rise [1]. Online games are the inevitable product of the development of electronic games and computer networks to a certain stage. Since the emergence of online games, Chinese online games have been growing and developing rapidly with the support of computer and Internet technology and the continuous influx of commercial capital [2]. With the growth of several generations of players, video games are becoming a part of people's cultural life, just as people take art, literature, music, TV movies as a part of cultural life, which also means that people's interest in games will continue to increase [3]. While bringing teenagers rich experience and pleasure, online games also have a subtle impact on Teenagers' world outlook, outlook on life, values, morality, cognition and behavior [4]. The emergence of educational games has brought entertainment and interest to students' boring learning, which can realize the change of students from tired of learning to willing to learn. Its purpose is to stimulate learners' interest in learning and promote learners' Autonomous Learning [5]. The development of educational games, catering to the psychological characteristics of the learning subject with the perceptual of the game, and continuously leading the learning subject to the rationality with the rational of education can not only break in the
dislocation between the educational content and the educational subject in traditional education, but also help the game industry get rid of the current situation of high economic value and negative social value, so that the two major industries of education and games can develop together Exhibition [6-7].

Game is a kind of regular and non utilitarian activity that people voluntarily participate in. This kind of activity is often accompanied by pleasant, nervous or immersive emotional experience. Only when players have this immersive experience can their motivation to continue the game be stimulated [8]. Learners are the main body of learning activities, any learning media must serve for learners' learning activities, and learners' characteristics will have an important impact on students' learning process [9]. Therefore, whether the design of educational games matches the characteristics of learners is the key factor to determine the success of educational game design, and the design of educational games must be based on the characteristics of learners. At present, educational games generally have the problem of poor playability, that is, not enough immersion experience for users, which is one of the reasons why educational games cannot compete with commercial games [10]. As a combination of art and technology, electronic games have a significant interactive feedback characteristics. If we can reasonably combine the educational content and adopt the correct way of guidance, electronic games will have a positive educational effect [11]. Based on the feature extraction technology, this paper analyzes the construction method of the design pattern of electronic educational games, strives to balance the educational and game nature of electronic educational games in the design program, and provides a new idea for the construction of teaching resource database.

2. Educational video game design needs

2.1. Identify customer audience

The final product of the game is put on sale in the market as a commercial product, so the developer should make clear that it is oriented to the group and confirm the market positioning of the game in the design stage. In traditional teaching, according to the characteristics of learners, many scholars have carried out in-depth research, and formed a more perfect theoretical system. In teaching activities, learners' cognitive, emotional, social and other characteristics will have an impact on the learning process. In order to achieve the success of teaching activities, we must pay attention to the analysis of learners' characteristics. When we listen to music, we often have such an emotional experience. When a certain segment is repeated repeatedly, we are brought into a certain emotion. However, as the repetition of melody continues, we begin to look forward to its change and completion, and gradually become suspicious. If the repetition continues, we will have a sense of tension, and the degree of tension will continue to increase, so that we begin to urgently seek relief. Composers make use of the two different stages in the process of human emotion to complete the emotional interaction between music and audience.

Because the age of players limits their real social behavior, the actual buyers of such games are parents. Therefore, the game design must consider the perspective and cognitive scope of the parent group at the same time. The game provides a virtual situation and game behavior mode for players. The pleasure of users in the game actually comes from the release of high load emotions accumulated before, that is, anxiety, tension and other emotions. Therefore, in fact, the role played by the game is the same as the example of symphony. It can be said that the game intentionally designs the situation to "tease" the player. The game must be interesting. Designers should make use of the platform hardware, interactivity, interface, sound, animation and other basic elements to make the game interesting, so as to ensure that the players can get an eye-catching and fun game experience. Environment transfers or changes players' emotions by using its unique visual style, so we need to learn from real reference materials when determining the environment and setting the visual style, that is, the image reference that helps to change the vision and style orientation.

2.2. Game interactivity

Although human beings have all kinds of intelligence, the development of different areas of human
intelligence is controlled by the cerebral cortex. The damage of the corresponding cortex will affect the development of related intelligence, but it has no substantial impact on other intelligence. Language intelligence is damaged, but the field of motor skill intelligence is intact. The unpredictability in the game situation is an important factor that causes suspense and makes players expect. In the process of the game, the players make decisions on the next action according to their own expectations, and then constantly revise the expectations according to the results of the action. If their expectations are not consistent with the actual effect, they will have a sense of tension and anxiety. Every kind of intelligence plays a huge role in the process of human understanding and transforming the world, and it is equally important that there is no distinction between primary and secondary. How many kinds of intelligence can be discussed and changed; everyone has different intelligence characteristics because of their original biological potential and different acquired intelligence development. The virtual world of the game needs to start from the practical and realistic reference point to make it suitable for the needs of the game.

The designer assembles the various elements contained in multiple real reference points together to form the final game scene, and then modifies and refines it according to the playability of the game, which is the key to designing the game. The theory of multiple intelligences emphasizes the richness and diversity of intelligence expression. People show their talents in a certain intelligence and among multiple intelligences. Cultural differences and environmental differences determine people's different understanding of the meaning of intelligence and different requirements for the forms of intelligence. Video games should simulate the real world to a certain extent, and transform the abstract game concept into a model known and familiar to players. This is the necessary condition for players to understand the game and interact in a meaningful way in the game environment. In this way, players can make the interaction process more intuitive and easier through their existing experience. In fact, the game simulates an environment that can be directly associated with. In this environment, players are limited to move and take relevant actions only through specific key operation, and it does not violate the game background and human thinking logic. This kind of operation mapping imitates the essence of the motion involved in the relevant action according to the corresponding part of the game in reality. In the analysis of learners' characteristics, we should focus on the factors that have a direct and important impact on the current teaching system design, generally including learners' cognitive development characteristics, learners' starting point level, learning motivation and learning style. These characteristics play an important role in improving the applicability and pertinence of the teaching system.

3. Educational game design methods and Strategies
Educational games emphasize to show knowledge in real task situation, and transform abstract and general teaching requirements into situational goal description, so as to achieve observable and measurable learning results. By designing multiple learning topics, the analysis of teaching objectives determines the basic concepts, principles, methods and processes of each topic, and provides a general direction for learners to make their own learning objectives. Electronic educational games are electronic software, which are created by game designers and producers, carrying specific educational and entertainment purposes. Its running state can provide game environment with educational content for players, and players can carry out game activities in this environment. For the game, the story can be a part of the game, or not. The content of the game can exist independently of the story. There are both connections and differences between the two. The design of the game needs the inspiration and passion of art, and the realization of the game needs to adopt the correct and effective development method.

Game developers need to adopt an organized and reusable development method. They need to obtain the correct requirements, so as to make a reasonable budget and make a project plan accordingly. In the development process, developers should strictly implement and implement the plan, so as to successfully complete the game project development. The goal of the game is the player's expectation of the result of his own game behavior, and is the motivation and reason for the player to
participate in the game. The teaching resource library based on educational games is shown in Figure 1.

![Figure 1 Teaching resource library](image1)

As the design goal of electronic educational games, it includes the expected results of players' game behavior, including the entertainment design goal and the educational design goal. The goal of game entertainment design refers to the game designer's expectation of the results of game entertainment activities [12]. In general teaching software design, teaching design is the first step. Game layered design is based on teaching system design. Through the analysis of teaching objectives, learning content and learner characteristics, it can identify teaching problems and needs. Through the plot description design and role design centered on game task design, it can design game learning resources, strategies and cognitive tools, and choose the best teaching method. Choosing the game teaching mode and finally determining the positioning of the game learning environment prototype education software is basically a supplement to the traditional classroom teaching, so it is difficult to get rid of the boring and repetitive characteristics of traditional teaching. In contrast, the game is more interesting and interactive, and it is easier for the participants to be fascinated and go deep into it. The game activities of the players in the game environment are purposeful activities, and the goals of the players will change with the development of the game process. Gadamer believes that when the players seriously enter the game, under the constant temptation of the game, the players gradually deviate from themselves. Prototype design is a kind of preview method. It develops a kind of experimental model to reflect the design concept relatively quickly and cheaply. It creates a special mechanism to test its function and understand the user perception. At the same time, it gives a fuzzy but initial image of the whole game. The interaction between automation objects and automation customers is shown in Figure 2.

![Figure 2 Interaction between automated customers and automated components](image2)

Story is a kind of memory behavior of human beings to their own history. People remember and spread the cultural traditions and values of a certain society through various story forms, and guide the formation of social character. Stories build the cultural form of a certain society by remembering and telling the past events. The game can be played in a linear structure or a multi-line structure, and different game experiences can be provided to players through branching plots and multi-line plots. On
the basis of general game rules, e-education game rules should also ensure the health and scientificity of game behavior. That is, it should also include the provisions of educational value. Therefore, the regularity of e-educational games can be understood as the stipulation which contains educational value and is preset by the game designer according to the design goal of e-educational games, which is used to regulate the game behavior of players compulsorily. The strategy of e-educational games refers to the strategies adopted by players to achieve their game goals according to the specific game process and their own situation. When designing any game, it is considered to adopt corresponding means and methods to attract and maintain players’ participation, which is called game design strategy. As the freedom of e-education game, it shows that the autonomy of players is fully respected, and players have the freedom to choose games and plan game plans. However, considering that many players, especially young children, do not get into the habit of paying attention to the knowledge hidden in the game environment, they need to be properly guided so that players can learn to absorb nutrients in the game and then get into the habit of learning in the game. Only in this way can the educational effect of the game be brought into full play.

4. Conclusions
The essential characteristic of human beings is that they have highly developed intelligence, and the degree of development of intelligence determines the success or failure of human beings. The theory of multiple intelligences has profound educational significance, which has great enlightenment on educational theory and practice. E-educational games are not the same as games or teaching courseware. They are a mixture of education and games, and can be produced in different parent bodies. However, as educational games, it is necessary to take games as the body and education as the key link, and not neglect interest because of their educational nature. What the game industry values most is innovation, because this is the market breakthrough. It is not enough to be confined to existing games. Developers need to have the ability to break away from games and bring back things beyond game development, that is, to find things they like and are full of passion in life, and then add them to games. The same type of games have different immersion experience characteristics, and different types of games have different immersion experiences under the influence of the age, gender, game platform and game time variables. As a game developer, if you want to succeed, you must make a solid preparation for project-based game development in business environment. The strategy proposed for educational game design is only the enlightenment of rational analysis based on the immersive experience results of game types, but the operational problems of the strategy and the effectiveness of the implementation results still need to be further discussed and studied.

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