

# Design and Development of Mobile Educational Game in Mobile Internet Environment

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**Abstract:** Mobile learning effectively expands and extends the time and space of learning. With the development of mobile Internet and mobile terminals, the integration of mobile phones and educational games will be an effective extension of mobile learning. From the perspective of educational game theory and multimedia cognitive theory, this paper analyses the role of games in promoting learners' cognitive development, summarizes the common characteristics of current educational games, sums up the standard model of their design, and analyses the shortcomings and shortcomings. The use of these mobile devices not only effectively breaks through the limitations of traditional classrooms for learning places, but also provides practical feasibility for people to learn at any time. This paper analyzes the constraints of mobile phone education game design, and proposes corresponding design strategies from the perspective of development, education and learning, education and learning, in order to improve the research and development of mobile education game design.

## 1. Introduction

With the rapid development of wireless communication technology and the continuous improvement of the performance and price of smart phones, more and more people use mobile phones to carry out mobile learning. The application of mobile educational games based on mobile learning, which combines educational games with mobile phones, has gradually set off a new wave . The primary task of basic education reform is to tap children's creative potential and promote the development of their cognitive and thinking abilities. However, in the actual teaching, there are still many drawbacks, such as paying attention to the development of children's wisdom, ignoring the cultivation of emotional ability . Because children participate in these social games, they not only get close physical contact and social interaction opportunities, but also learn the basic rules and skills necessary for group life in the process of communication, thus promoting individual sociality. development of. Then in the process of teaching, teachers should divide the scope of students' learning, because different levels of students have different contact abilities, so we must pay attention to this content in the process of setting up the game. The learning resources based on the mobile phone client can be various in various forms. According to different learners, the time is not fixed, the location is not fixed, and the characteristics of various internal factors and the external environment are affected, and the learning form based on the mobile phone client is simply used for documents and videos. It is no longer able to satisfy the learner's desire to learn efficiently.

With the deepening of the new curriculum reform practice, quality education and innovative education have become the focus and development trend of school education reform. Then, after entering the era of digital information, with the in-depth development of computer graphics and image technology, the virtual reality and simulation functions of digital games represented by computer games bring infinite possibilities for learning. Usually, the learning of the game will be divided into technical aspects, processes and methods, and so on . For example, when learning junior high school language, teachers should first develop students to have a necessary understanding of some words, glyphs and idioms. These teaching "traces" which are not closely related to the game plot in educational games not only weaken the entertainment of the game, but also affect the learning effect. However, as far as the current development situation is concerned, due to the constraints of the development of mobile educational games, the effect of the

development is unsatisfactory, the pictures are not exquisite and vivid enough to attract the attention of learners effectively, and can not adapt well to the mobile learning environment . In the past, it was only regarded as a kind of teaching medium, but now it has become an interactive simulation learning environment. The change of the role orientation of the game also makes the digital game have a broader application prospects.

## **2. Problems in the Application of Game-based Learning**

Game and education have been integrated since ancient times, but later there has been a differentiation. Game tends to entertainment and sensibility, while education tends to be serious and rational. This divergence has led people to believe that education and games are two areas where fire and water cannot tolerate. However, in the actual mobile game, the number of colors that mobile phones can achieve is still an important bottleneck restricting the artists to play. Many mobile phones can not distinguish certain fixed colors, and even individual mobile phones still have serious color bias problems. Educational game is the combination of educational and entertainment. In order to get more profits, game developers often focus on the entertainment of the game, but ignore its educational nature. As a result, the content of educational game deviates from the learning goal and fails to achieve the desired effect of education. Learners are very prone to visual fatigue, which directly affects the expressiveness and size of the various characters in the mobile educational game, as well as the feelings of the players. The goal of many game companies to develop a gamified community is not limited to promoting learners' knowledge learning and cognitive abilities. Driven by economic interests, the online community products developed by them are mainly entertainment-oriented, while learning is subordinated, such as entertainment-oriented community games or activities, community competitions, and community chat rooms.

For a long time, developers have been working hard to eliminate the negative impact of high latency in online games. Mobile operators are also trying to increase the available bandwidth of mobile phones, but they have not considered reducing latency as the primary solution. problem. The biggest feature of mobile game-based educational games, and the most essential feature, is to balance education and gameplay, and to find a balance between the two. How to balance is a major difficulty in educational game design. The mobile terminal accesses the Internet at a slow speed, which brings about a long waiting time in the game if the Internet is connected, which makes it difficult to develop a fast action game suitable for multiplayer cooperation in the mobile terminal. As a result, younger children have cognitive impairment because of the relatively high difficulty of knowledge, while older children waste cognitive resources because of the low difficulty of knowledge. Because the wait time problem is not very important for non-game applications. This makes it difficult to develop multi-player fast action games for mobile phones. The current mode of educational game development in China is that product developers are independent of the education industry, and educational game developers lack the knowledge structure. Under such circumstances, it is difficult to guarantee the rational expression of educational game.

At present, most mobile devices communicate in the form of text, but the size and format of audio and video are limited. Many mobile phones can not distinguish certain fixed colors well, and even have the problem of color bias, which makes it difficult for many color-rich pictures to show the original effect. In the game learning community, the main purpose of the game is to learn new knowledge and consolidate their own knowledge. Game is only a form of learning. However, the learning environment presented by the current game learning community is unreasonable, which affects the learning effect. The most important function of mobile phone is to communicate, receive and receive short messages. This role positioning also determines that functions such as mobile learning and mobile entertainment can only be placed in a secondary position. Players of educational games based on mobile platforms are, then, game designers should first consider the characteristics of different learners when designing educational games based on mobile platforms. The picture is like the outerwear of the game. If you can't display its inherent color, it will directly affect the intuitive feeling of the player. If the design of the game only stays at the level of these memory knowledge descriptions, then the learner's learning style is very likely to become a

mechanical meaningless learning, thus inhibiting the learner's creativity and imagination.

### **3. Design Strategy of Mobile Educational Game**

Considering the limited processing capacity and storage capacity of mobile phones, special attention should be paid to the optimization of game pictures and programs. Under this premise, considering the beauty of mobile educational game interface, after all, a beautiful game interface and character image will make the player have a pleasant experience. As the main mobile communication tool, nobody wants to shut down the cell phone automatically when they need to answer the phone. Normally, people are unwilling to use all the power to play mobile games. In the complex process of learning, every learner enters a new learning process and a new field of knowledge on the basis of the knowledge already learned, the skills already possessed and the attitudes already held. Therefore, in the design of mobile educational games, the operation should be simplified as much as possible, so that the player can develop the operation of the game under a natural button condition. Educational game design for the necessary conditions of an effective learning environment enables learners to generate a streaming experience in a gamified and effective learning environment, thereby stimulating learning motivation and promoting learning activities. Also consider the scalability of the game, to facilitate the maintenance and expansion of the game in the future. At the beginning of game design, it is impossible to design perfect. With the development of various aspects, the game should be modified and expanded to promote the promotion and application of educational games.

If you can provide interpersonal interaction or competition in the game, it will be greatly loved by the players, even if there is only one score leader board, it will make the players ecstatic. The knowledge points in the game are also inter-connected. In the design process, coherent knowledge points can be embedded in different games to reduce the boring feeling of gamification learning on practicing different knowledge with the same game. The positive feedback on learning elements and the interaction between people in the game process also enhance the entertainment effect of the game, which is also beneficial to further stimulate the player's desire to learn. Let the students clearly understand where there are deficiencies, in order to facilitate the next step of learning. When completing this exercise, the game should set up a scoring link for students, so as to better enhance students' learning enthusiasm. In the design, it can provide appropriate props for the players. The use and acquisition of props can enhance the playability of the game and stimulate the curiosity of the players. Therefore, the design of educational games emphasizes the active cooperation between game designers and educators, which provides greater possibilities for the balance between educational games and games, and strengthens the integration of educational games with subject teaching or learning. The greatest benefit of mobile games is to satisfy students' curiosity, but also to improve the existing teaching system, so that students feel a certain degree of fun in the process of learning.

In the game process, learners constantly use the existing knowledge to complete the game task. At the end of each part of the game, the designer should provide a detailed learning evaluation or feedback to illustrate the learning situation of the player. By setting up some feedback links, and then better help students to find their own place to improve, this kind of game teaching mode is of great help to enhance students' learning enthusiasm. The combination of online games and education is positioned in the online game-based activity curriculum, so as to achieve the best balance between game and education. The design of online game-based activity curriculum is driven by the theme to analyze the educational objectives and construct reasonable interactive and vivid plots according to the objectives. And pay attention to the design of moral space. Objectively evaluate the level of learning and give appropriate suggestions to guide the player to summarize and reflect. Educational games are essentially an educational software. By adding mainstream game elements such as characters, equipment, levels, etc. to some educational software with game potential, educational software has the characteristics of mainstream games. This design is mainly to facilitate the recording, to automatically obtain the current time, and to save it, which has a great advantage for the students' learning and knowledge review. Detailed instructions should be

provided when downloading and installing the game. The navigation system of the game should also be clear and clear, and provide appropriate guidance for the player, and will not be confused.

In the design of mobile educational games, appropriate incentive mechanism should be introduced, which allows the player to accumulate the experience and intelligence value after completing different types of tasks, so as to achieve the purpose of upgrading the level. In the game, different characters need to be designed for them to choose to play, so that learners can exercise their respective rights, communicate with others, and achieve the purpose of adjusting and balancing self-social roles in interaction. However, in this session, some game code is usually set up. As long as the setter performs specific analysis according to the actual situation of the student, the process can be completed very well. The learner education game based on mobile platform not only requires the function of knowledge description, but also emphasizes the function of interactive feedback. When designing educational games, we should pay attention to the learning content of mobile educational games, which should not be too difficult or too simple, and should have a certain balance. Students should not be frustrated because they feel too difficult, nor tired because they feel too simple. Secondly, from the perspective of experiential teaching theory, in order to enable learners to experience behavioral feelings that can not be experienced in real life, it is necessary to design games that can satisfy learners' experience of rich life, in order to promote their active participation in real social practice. By adding game elements to enhance the attraction of software, so as to carry out teaching in the form of games, which also forms the present game-based education.

#### **4. Conclusion**

With the development of wireless Internet and mobile terminals, mobile games are becoming more and more popular and educational games are becoming more and more perfect. Mobile educational games will be the inevitable trend of the integration of mobile phones, education and games in the future, and will be an effective expansion of mobile learning. The innovation of this paper is to abandon the traditional model of educational game construction and put forward a new design method based on game-based community educational game. In addition, the paper also makes corresponding innovative exploration in other aspects. In the modern social development, mobile games have developed a diversified and diversified development trend. In order to better satisfy people's pursuit of games, the design of mobile education games based on mobile Internet environment has been designed with educational significance. The game, and it has been very good. According to the specific needs of the learners, combined with the problems encountered in the application process, improve and design better educational games that are more suitable for learners. In the design and development of mobile educational games, not only must consider the functional characteristics of the mobile phone itself, but also need to be based on certain educational and learning theory to make it better to play its educational and entertaining functions in the mobile learning environment.

#### **References**

- [1] Pasi Fränti, Mariescu-Istodor R, Sengupta L. O-Mopsi: Mobile Orienteering Game for Sightseeing, Exercising, and Education[J]. ACM Transactions on Multimedia Computing Communications and Applications, 2017, 13(4):1-25.
- [2] C - H. Su, C - H. Cheng. A mobile gamification learning system for improving the learning motivation and achievements[J]. Journal of Computer Assisted Learning, 2015, 31(3):20.
- [3] Koutromanos G, Avraamidou L. The use of mobile games in formal and informal learning environments: a review of the literature[J]. Educational Media International, 2014, 51(1):49-65.
- [4] Lee H, Parsons D, Kwon G, et al. Cooperation begins: Encouraging critical thinking skills through cooperative reciprocity using a mobile learning game[J]. Computers & Education, 2016,

97:97-115.

[5] Rubino I, Barberis C, Xhembulla J, et al. Integrating a Location-Based Mobile Game in the Museum Visit[J]. Journal on Computing and Cultural Heritage, 2015, 8(3):1-18.

[6] Navarrete M. Mobile Learning and English Language Learners: A Case Study of Using iPod Touch as a Teaching and Learning Tool[J]. Journal of Interactive Learning Research, 2014, 25(3):373-403.