2012 International Conference on Education Technology and Computer (ICETC2012)
IPCSIT vol.43 (2012) © (2012) IACSIT Press, Singapore

The Research On The Teaching Game Based On The Learning Platform

Yuanhui Guan[a], Guangyu Mu[b], Desheng wu[a,*]

[a]School of Information Communication Engineering Changchun University of Technology，Changchun 130012, China
[b]School of Management Science and Information Engineering Jilin University of Finance and Economics，Changchun 130117, China

Abstract. The network teaching game is one of the branch of computer games, the existing educational games can't meet the need of learners and society. By the teaching game modular research more teachers can easily develop the network teaching game. And we take deep research in the three ways on how to develop the module: use COMSOK development COM components directly;By The supportted of MFC's COM to development; Through the ATL to realize COM components.

Keywords: EDUCATIONAL GAMES,COMPONENTS,DEVELPING

At the beginning of 2010 , xinhua news agency reported such a news: a bulletin was released by the university of Hertfordshire that researchers of the school psychology have tested the effects of video game system which develop in a company. The context is interesting game of educational properties, in the game children wear a helmet, with the encephlogram detection equipment, if the player could focuse their attention, they can control the process of the game, if the system detect transfering of its attention, the games would stop.The researchers have ten hyperkinetic children to take this game three times a week, 12 weeks later, These children's excursion behavior related to attention shift are significantly lessen.In the business world, computer games used for staff training is not fresh[1].The effect of computer games used for enterprise training is very good.It can reduce the training costs of the enterprise;By the use of game interaction, it could inspire the staffs' interest on study and make them to learn more relaxed;Through calculating the scene simulation of the game, the management would know clearly whether trainee had handled the knowledge according to players' rank and performance in-game, and could be applied in the practical work.Moreover, this kind of training using computer games have been not only applied to multinational companies (such as Coca-Cola company) ,also been widely used for manufacturing industry, government departments,Banks and other units.

1. The Emergence Of The Bottleneckn

With continuous education games walking into our life, the problem appears . The original education game is mostly provided by educational experts and specialists discipline of scripts, then the technical personnel design and develop the game according to the scripts. This development mode has two drawbacks: (1)the development cycle is long and the cost is high.Once the needs change,we have to redesign and develop again; (2) Due to a lack of frontline teacher's participation,it's hard to reflect the teaching strategy of the frontline teacher. So the education game developed is often difficult to apply to the actual teaching.As is shown in the figure:

* Corresponding author. Tel.: +86-13844010118.
E-mail address: guanyuanhui@mail.ccut.edu.cn

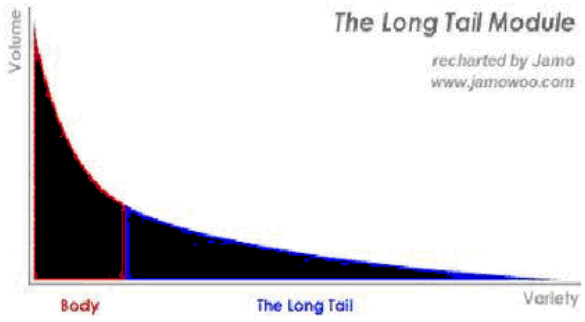

Fig. 1. The Long Tail Module

There are also two intriguing phenomenon in the process of designing and developing computer games. On one hand computer games as a burgeoning industry rapidly boom all over the world, the breakthrough of related technology emerge in endlessly; On the other hand, because of the difference of player race, region, the traditional culture, age, gender, vocation and the educational attainment, the demand for the game is also different and the speed of the game development can't meet the needs of the community. The situation makes us easily to recall "software crisis" happened before[2]. It also makes us realize that the change of ideas in software design, will be also inevitable on the design and development of computer games, namely: computer game design would only walk the way of Modularization.

2. Recent Development Status And Trends Of Home And Abroad

In recent years the Educational games research at home and abroad, mainly concentrated in three aspects:

Theoretical research, applied research and the technology development.The theory of educational games research mainly focus on three questions: what kinds of computer games belong to the instructional game?The role of educational games? Why use the instructional games ?[3]A website of software company which believes that "the game learning" is an effective way of learning is Ga mesZ Train.com has all kinds of online game applied to various cases of teaching modes.The White Paper details the result of their research in the "Concept Declaration" of website.[4]They think that games can stimulate the students' participation in strange experience enthusiasm: when we are willing to learn, we will learn better; Many factors in the game can accelerate learning speed, make learning more effectively. Learning in the happiness of game make children learn more and remember more.As shown in figure:

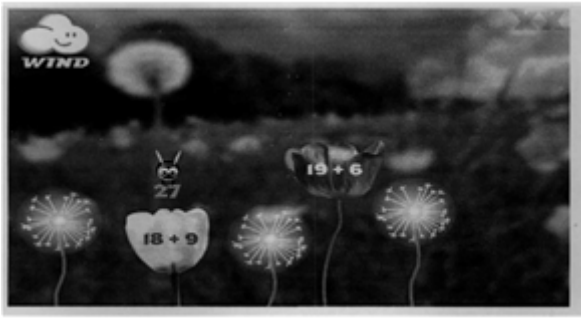

Fig. 2. The Math Eductional Game

The educational games in the application of real life are various, some focuse on the usage of educational games in specific disciplines or areas,in addition ,the effect on learning changes between the gamers and the control statistics, for the comparative analysis;Others research the use of teaching game whether affect the player's mental health in a higher perspective, including intelligence, personality, social skills, etc.Researchers at the Massachusetts institute of technology have designed a game called "Supercharged", this game was used respectively in junior high school, high school and the

university.Several years later, the researchers found that the game really make students understand complex phenomena and acquire correct concept[5].The happy farm is one of the example as shown in figure:

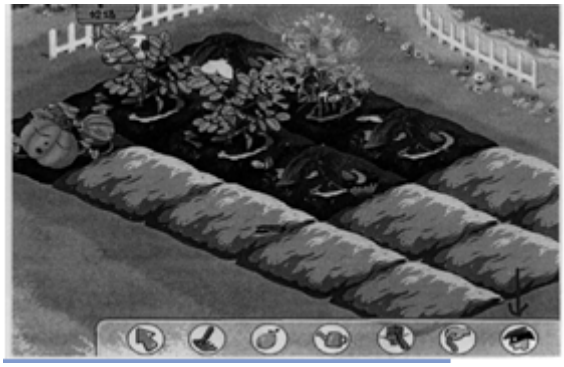

Fig. 3. The Happy farm Game

The aspects of technology development: one man with two or three day can finish a small game is possible, the game for the teacher who has a little skill and the foundation of the design of art is not a problem.This is why flash is used as the tools of teaching game design is so popular. Accordingly, the technical doorsill of design of large scale networking intelligent game is not easily overcome for ordinary teachers. Therefore, teachers will like one who masters flash learns to design games from the floor,this kind of design and commercial game matched teaching game is unrealistic.But large such as role-playing teaching game is what the student really need,but it is more scare currently.

3. Proposes The Direction On Research

The development process in teaching game is different from the general commercial game, also is the development body. General game has special team for development, developing products used for commercial purposes[6]. However, teaching games are mainly developed by teachers, and it is used in teaching. The development team of commercial game has strong technical force, not depend on component technology, technical person can program the hardware directly, also can use the existing components. When developing the large teaching game, teachers could not begin from programming at the bottom, because a big game needs tens of thousands lines of code at the least.

In addition, the goal of design which other commercial games and educational games use components, is different. The components of commercial game is emphasize special effects to attract people, such as the explosion shooting raced the smoke, shot at the gunpoint, and the object cuts etc. Educational game don't need these, and the component of educational game should be able to provide the framework to teacher which can build games prototyping rapidly, mosaic conveniently , intuitive effectively. Modular of teaching game make teacher’s design diversified such as emotional, attitudes, value system parallels between "want" and "do". Finally, due to the difference of evaluation method, it is different from commercial game to educational games component[7]. The component of educational game is ultimately to serve the teaching game design, so the evaluation standards of a component also different from commercial component. In the commercial components, role behavior may include a boxing, kicking, jump, bent, etc. But educational games role in behavior as well as searching, hedge, path planning and other smart aspects. Therefore, educational game what developed by teacher must use components.

The Component which simply package the data and method, have their own properties and methods .Component technology is a development trend on the technological development of modern software. The method of Component programming is to decomposed complex program thoughts into some function design process which are relatively independent component module. The key of component programming purpose is to make program between each module, let each modular could individually development, separate tests. Between them, components can cross process, cross-language even cross-platform mutual communication even calling its host language program confluence together naturally. Strictly, component is not APi functions, not DLL (although many times, coM components borrow DLL

shells)[8].Different from other senior language, component advocated reuse, no language to be environmental restrictions and could not name conflicts. Component specifies its binary module (DLLs and EXEs) structure characteristics, and takes it as a standard stipulated in how to organize COM object.

4. Seek For The Solutions

The author thinks that by lowering the difficulty development of the educational game namely: Teaching games for modular designs can be solved in encountered bottleneck in the development of educational games, underneath writer will further exploration the manner of modular.

The studies find that design a component can have three ways: use COMSOK COM directly for the development components;The COM support by MFC to realize COM omponents;Through the ATL to realize COM components.COMSOK development which uses the most complex, but the has great application value, because the use of this method is the only way to change the already oriented system into the system component. And use ATL design components is often the design of the applied to network , it is the most simple relative way to the two kinds of design process before .

4.1. Develop the COM components Using COMSOK Directly

We will be appropriate changes applications by using of classes, packed into DLL, namely in the class definition file to derivation the member by the class functions dllexport, and the realize part not modification.Then we construct a DLL's shell, will the modified class definition of header files and Kind implementation file join project, after compile generated namely Sample DLL and Sample. Lib.Constructing another master procedure again called 1 and 2, now the client is a kind of definition file and a dynamic-link library packaged completely.Implicitly call for client with Sample, and copy the Sample.dl into the consulting client in the directory.To Operation client's program, the results prove in doing so procedures can run normally. As shown in figure:

From the first step object oriented to component oriented is to pass the evolution of packaged in DLL. Completed the work above we will find, so far,we realize that the original part of the files can no longer needed.To some extent, played the role of client confidentiality,class make it far away to the implementation details.But customers call part without any modification.On the basis of program gradient changed, once again we should add the ingredients into COM components, which an object-oriented "system" will be transition into COM for smoothly.If we have according to object-oriented method to establish the class and application, then we could make it transformed into the system component oriented.[9] It is possible to transform the system into component oriented base on object-oriented technology .If a land to be developed by the system, hoping the component oriented technology.So began using COM library API from the floor to build the whole system will appear more complicated.

4.2. Provided by MFC realize COM components

Using MFC provide COM for the development of COM application may simplify the development process, improve the degree of automation, shorten the development time. MFC using the object-oriented approach take COM in the basic function of some MFC package of c++ classes, developed by inheritance these classes to get COM support functions in order to make a derived class conveniently to obtain various characteristics of COM object, MFC has many predefined macro, these macros function mainly is to realize the COM interface definitions and object registration , etc. In addition, MFC also provides for automatic ordinary and ActiveX controls support, and in this two aspects, Visual c++ also provides corresponding Appwizard and class wizard support scale-up, this visualization tool more convenient the COM application development.

ATL is abbreviation of Active TemPlate Library template library.Use ATL can quickly develop COM components in visualization integration environment, and the components is developed through code optimization "thin code slimcode"[9]. Although ATL is tools which to develop COM components, but to make good use of It we should to quite familiar to COM technique in premise.All this is in order to coordinate the design personnel to understand the principle component. So, ATL looks intuitive, but it is

hidden behind the complex technology. If want to design powerful and split join together of the components, it must know somewhat of the techniques used ATL.

4.3. ATL realize COM components

Develop a COM components by ATL can be divided into the following steps:

To create a new project basically using ATLCOMA Pwizard.The choice of COM server either Dn or EXE.When the server is DLL, guide allow bundling custom agent/stub code in server.

Add a class shell for the components built environment. ATL support variety of class template , in the ordinary circumstances, we choose to notice simple Objeet ,automatically ATL to generated relevant code.

For our own design class add attributes and methods. Attention that the definition method need to limits the type parameters input and output at the same time. Because COM components is language neutral, and hardware structure neutral model. Therefore its data types must to be universal.

Provide scripting language support. When the design components will be applied to scripting language, it need to add double interface support in class attribute options. Such ability can use in component scripting environment.

Increase incident response mechanism for the components. in order to arouse events, need to appropriate the method calls the receiver for each receiver tie-ins to register the interface pointer.

5. The Analysis Of The Educational Game Components

Final product of education game development tools is education game. Therefore, education game development tools needs to consider the game elements. Prensky (2001) think that computer game boils down to six key factors[10]: rules, goals and objectives, results, and feedback, conflict/competitive/challenge/confrontation , interactive and characterization or story. In the design of the education game development tools, these elements should be considered. Conventional game development tools did't involve teaching concerned, no reflect certain teaching concept, therefore, education game development tool design must be relevant to teaching, need to contain teaching aim, teaching content, teaching evaluation factors. Combined with the characteris of educational game, the author thinks that education game development tools need contains the element as follows:

5.1. The teaching goal/game goals

The teaching goal is through by after teaching of learners should be displayed the concrete, visible behavior, it is clear expression implementation evaluation basis of education game.In education games, teaching goal and game target are at the same sometimes.Teaching goal can motivate learners to participate in game activities. And can be used as a measurement gamer participated a basic standard result in the game activities. there is no size about goals, it is decided by the games learning content.

Teaching goal is also stratified, for some knowledge. You just should know it, and some knowledge needs to grasp skilled.

5.2. Teaching content/challenge/task

The teaching contents in education game performance for the game tasks, learners through the completion of a series of challenges and task completion teaching content of study.The teaching contents is according to the request of teaching goal to carry out strict organization.In educational game, teaching contentcan could present in many ways. Like learners and NPCS talking, fulfil a task,answer and other forms.Teaching contents must in appropriate difficulty, learners should be lose faith when it is too hard, it is hard to sustain learners' interest when it is too simple.

5.3. The teaching goal/game goals Teaching evaluation

Teaching evaluation is according to the teaching goal, the performance assessment activities at the request of learners in game activities.Teaching evaluation including formative assessment and summarizing

evaluation. Through the record in game activities of learners to realize behave formative assessment, and through the final score and obtaining rating means concludes evaluation.

5.4. The rules of the game

The game is based on a series of rules to execute, it set up the basic ways for the player to participate game, in game it is enforceabled .education games are based on certain rules which embedded in the education game for learners, among which provides a fair learning environment. Design should fit to the rules of learners' characteristics, such as for easy children. Unfavorable setting overly complex rules of the game.

5.5. Incentive mechanism

Incentive mechanism is one of the important means to keep higher learning motivation in game activities.Based on a series of experimental conclusions, Malone and Lepper proposes a complete set of individual "intrinsic motivation" theory. Analysis of learners' motivation motivated by four factors: challenges, curiosity, control and fantasy.In the course of the game, when learners finish a task, can be given a certain incentives, such as the increases of the learner experience value, gain some dummy,the increase of life value, etc.

6. CONCLUSION

Game research could have been traced back to Aristotle's age. Since then, all previous dynasties scholars had developed various game theories, including Schiller's instincts theory; Spencer’s energy excess theory; Ruth’s life ready theory; Freud's desire catharsis theory, etc.

Applying the computer game to education teaching is a try of education workers. Trying to find some sort of balance in the entertainment and education attempt. Striking up the relationship between interest and learn. Therefore, to design a game should make players get more learning achievements. At the same time of reflecting popular game trend, education workers can make themselves convey their expressing thoughts smoothly. The center thought on this research is out of the above considerations: using component technology design large education game of role-playing , making education workers teaching at least can be generated fast under the support of the game, set the scene of role behavior, configuration, and interactive methods to build a bridge between teachers and teaching game design. The research is suitable for reform and development of education system, it has a small risk, and there isn't a perfect system or components design education game for teachers, the market prospect are widely.

7. Acknowledgment

The authors are grateful to the support of the Education Science Programming Funds of Jilin Province under Grant No.GH08130

8. References

[1] LIN Qiao_min,LIN Ping,WANG Ru chuan.Research on Collision Detection Algorithmsin 3D Game Development, Computer technology and development May 2010:39-46.

[2] FardjiF,RezaieAH,Ziaratban M.Morphological—BasedLicense Plate Location.IEEE Image processing 2007(1)pp:57-60.

[3] HeXianjian,ZhengLihong,Wuqiang,eta. Segmentation of characters on carlicen seplates.IEEE,Multimedia Signal Proessing 2008(:399-402.

[4] Abdullah,SheikhSH,KhairuddinO,eta. license seplate recognition based on support vector machine.ICEEI,Electrical Engineering and Informatics 2009:78-82.

[5] JimeHnezP,Thoma~F,TorraSC.3D collision detection a survey .Computers&Graphi 2001:269-285.

[6] XIAO Chengyong,Xiang Weiming. Constructing 3D Gam e Engine Based on XNA.Computer Knowledge and Technology,May 2010:340-341.

[7] Architecture of 3D Game Renderer and Its Technologies. Application Research of Computers Aug.2009:45-48.

[8] Wang lei.The Game Scripting Language Lua.Computer Knowledge and Technology Feb 2010:899-901.

[9] HuQiguang,WuRonghui. Study on the Flash Design Based on Flash ActionScript3.0. Computer & Digital Engineering Apr 2010:147-159.

[10] DongYingying,WangQifeng. Designing Typing Cartoon Game Based on Directdraw.Computer Applications and Softwar Apr,2010:169-171.