Abstract

How can game designers realize the balance of “educational function” and “entertainment” in a Computer-based Educational Game (CEG)? The concept of IMS learning design (LD) may be an available method and notion. In this article, a design structure of CEG based on activity theory was set up firstly, and then how to use LD to model each element in CEG was described, which was illustrated by an integration case as well. Finally, the conclusion was got that LD used as a framework of game activity designing can improve the effectiveness of CEG.

1. Introduction

Computer-based educational game (CEG) is a new area; it has been introduced into education as an alternative to the traditional way of teaching because of its funny and informative. But, there aren’t many CEGs of good educational quality and maybe it is the appropriate reason for introducing IMS learning design into this domain.

2. Understanding the Structure of CEG

According to the activity theory and system theory, the design of the game can be regarded as an activity system as well. The CEG activity system can be divided into six elements. (As showed in Fig.1).

3. Using LD to Model CEG

A correspondence can be established between CEG and LD (Table 1.)

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Table 1. **Correspondence between LD and CEG**

### 3.1 Elements of CEG Modeled in Level A

- **Player----Role**
  
  The player in a game is the subject. Role in LD allow the types of participants in CEG to be specified. Therefore, we can use LD to specify the roles and numbers in CEG flexibly.

- **Task----Activity**
  
  The task is what the player must complete; it is possible to employ activity to realize the design of task. Introducing activity into CEG will make it more friendly and personalized.

- **Tool----Environment**
  
  The environment of LD can be used to model tool in the structure of CEG, though it may be not enough to satisfy the need of the designer, but IMS LD can integrate other specifications if needed.

- **Division of task----Role-parts**
  
  Division of task is the responsibilities each player has to shoulder in achieving the goal when playing. Role-parts enable several users, playing the same or different roles, to participate in the same act [4]. Each role-part associates exactly one role with one activity or with one environment. Multiple role-parts within one act are performed concurrently.

### 3.2 Elements of CEG Modeled in Level B

- **Rule----Activity-structure/Condition**
  
  Rules are regulations pre-designed according to the goals of games. The rule reflected in LD is activity-structure and condition; activity-structure contains activity and environment reference as well. Condition is used in conjunction with properties to further refinement and adds personalization facilities.

- **Group----Properties**
  
  Level B introduces properties, which form the basis on which to build user and role dossiers and portfolios [4]. A communication between players can be established. In addition, at runtime more than one user can be assigned to the same role. The utilization of role and properties can set variables to each player.

### 3.3 Elements of CEG Modeled in Level C

- **Interaction /Feedback----Notification/Property**
  
  Level C introduces notification, which can be used to promote interaction. It is possible to send a message to a role or to assign new activities [5], these reflections act as a pedagogical agent. Generally, it enables the automation of learning flow, which is triggered by the completion of tasks.

### 4. Discussions and Conclusions

It is a new attempt and method to use LD to model CEG; maybe it will bring a brand-new area. It is not only feasible, great benefits can also be attained by employing LD into CEG.

In conclusion, each component in CEG can be modeled in LD in virtue of some other relative specifications. This paves way for adaptive learning and role-play and simulations. It can improve the effectiveness of CEG, leading to effective learning.

### References


