ISBN: 978-989-8533-12-8 © 2012 IADIS

COLLABORATIVE QUIZ GAME DEVELOPED WITH EPIK

Bruno Sampaio, Carmen Morgado and Fernanda Barbosa
CITI/Dept. de Informática, FCT, Universidade Nova de Lisboa, Quinta da Torre, Caparica, Portugal

ABSTRACT

Games are currently being used by an increasing number of people, of different ages and in different contexts. Usually, they provide fun ways of interaction, collaboration, and competition among players. These aspects may be very important in an educational context, since many research studies confirm that games have many positive effects on students when used as learning activities. Therefore, we present in this paper a Collaborative Quiz game concept, which promotes collaboration between students and motivates them for learning. This game will be created using a graphical development environment currently under development, denominated Epik.

KEYWORDS

Collaboration, Interaction, Educational Games

1. INTRODUCTION

Educational games, compared to other types of learning materials, can transmit new concepts to players in a much funnier, interactive and dynamic way. Their use in education can contribute to an increase of students' motivation and skills acquisition (Sindre 2009). When accompanied by means of collaboration they also allow the development of skills like communication, cooperation and coordination, all relevant in teamwork and other daily tasks (Zea 2009).

Despite these advantages, games are not yet widely used in education, mainly due to difficulties involved in their development and distribution (Torrente 2009). However, in recent studies (Torrente 2009 and Moreno-Ger 2008), ways to solve some of these problems were already identified, involving the creation of tools that enable the development of educational games by teachers, and the use of Learning Management Systems (LMS) as a means of delivering them.

Therefore, we decided to create a graphical development environment for collaborative and competitive games development, denoted Epik (Edutainment by Playing and Interacting with Knowledge) (Sampaio 2012). This environment will support Moodle (Modular Object-Oriented Dynamic Learning Environment) integration, allowing teachers to deliver the games as Moodle activities and to reuse learning materials produced in a Moodle course. Epik will allow the development of collaborative quiz games, mainly because quizzes are one of the most used learning activities. However, they usually don't allow collaboration and competition among students, which will be the main difference between the usual quizzes and Epik games.

In the following section we'll characterize a collaborative quiz game to be developed with Epik and then we'll present some conclusions.

2. COLLABORATIVE QUIZ GAME

We will use Epik to create a collaborative quiz game with several multiple choice **questions** related to a certain **topic**. These questions will be associated with different **scores** and some types of **help** will be available for players, a bit like in traditional quiz games. The helps and scores shall serve as a way to foster collaboration and competition among the players.

The game shall be played by a group of students who may be in the same physical location or geographically distributed. This game will be organized in different scenarios, each composed of an equal number of questions for each group member. To progress in the game it will be necessary that all group

members respond correctly to the questions from the current scenario (coordination). If any member of the group is in doubt about a question, he or she could ask for help. Helps may involve interaction with other group members (communication and cooperation) and may be used a limited number of times throughout the game. The types of help available will be: (i) **learning materials consultation** - such as images, audio, videos, or files that contain the information needed for quick reference; (ii) **request hints from other players** - there will be a list of hints associated to each question, from which a team member can choose the most suitable to help his colleague; and (iii) **incorrect answers removal by a player** - a team member that already answered correctly to that question can help is colleague by removing some of the incorrect answers (also known as 50/50).

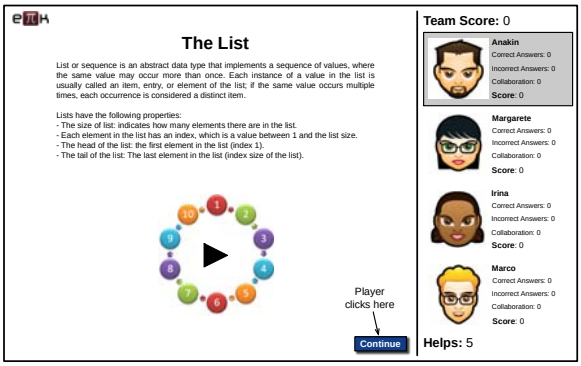
The scores associated to each question may vary depending on different factors such as time to answer, number of failed attempts and helps used. When a player correctly answers a question, he or she will immediately receive the currently associated score. If the answer is incorrect, the question score will be reduced in a percentage of its total value. The first player to answer all questions in a scenario correctly will receive a bonus with a specified value, which will be a very important aspect to encourage competition among the team players. Although, players must also collaborate with each other to progress in the game by using helps. By helping a colleague, the player receives a percentage of that question score, while his or her colleague receives the question score without suffering any penalties. However, what will determine if the help was successful will be the time the player takes to answer the question correctly after receiving help. If this time is greater than the given time to answer, the question score will be reduced by half and the player that helped will get nothing.

When the game ends, the team will be ranked based on its final score and other teams scores. This ranking is controlled by Epik and will act as a way to encourage competition between different teams. All these information elements will contribute as a form of awareness, with regard to the state and actions performed by the players.

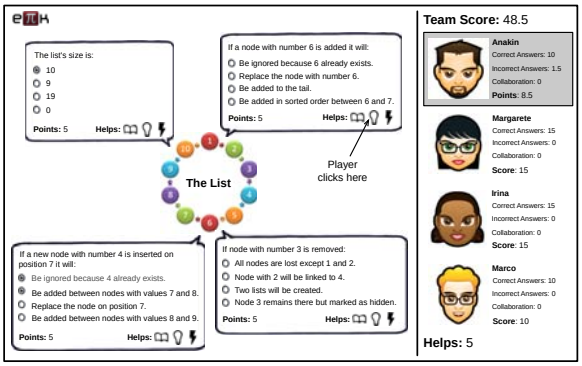
Throughout the game it will always be presented to each player the team score (sum of each player total score), all of the other players' scores and their respective avatars. For each player, the scores will be displayed and listed by the following categories: correct answers, incorrect answers, collaboration and total.

Moreover, all the information about team actions (such as, the quickest player to respond on each scenario, the number of attempts and helps each one required, the individual player score and the team score) will be logged in Epik and sent to Moodle. This information can help teachers with the students' evaluation.

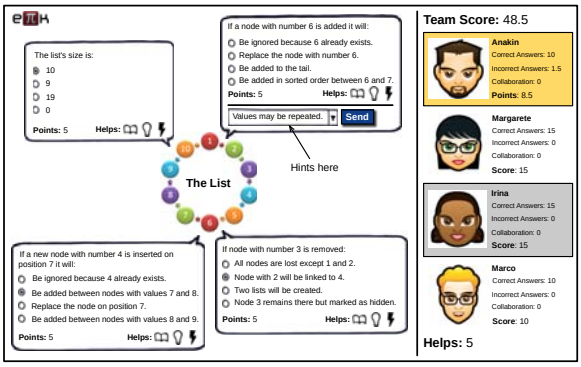
Figure 1 shows the example of a game scenario flow, which is related with programming teaching and has as main objective the demonstration of the abstract data type *List* behavior. This game may be an activity evaluated in a lab class or a homework activity, for example. In all the scenarios, the players' scores and theirs avatars are displayed on the right side and for each of them their information is highlighted on their own screen. At game start the scenario on Figure 1a is displayed for each player, where some concepts and a video are presented to them, in order to explain the List concepts. By clicking on the button at the bottom right of this scenario, each player goes into the second scenario (Figure 1b), where each one of them needs to answer a set of questions (the same for all players). If a player asks for a hint about the upper right question, the system selects another player to help him (Figures 1b and 1c - Anakin asks for a hint and Irina helps him).



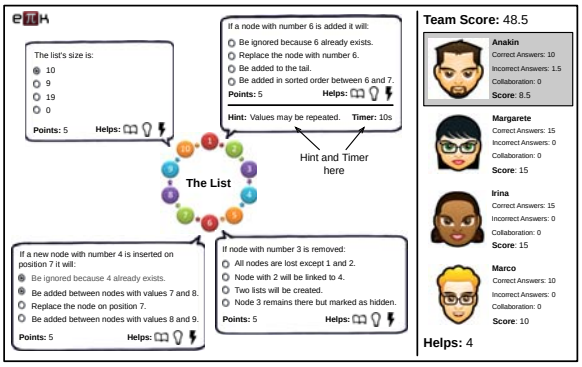
(a) Presenting a concept to players.



(b) Anakin asks for a hint on the upper right question.



(c) Irina chooses and sends a hint to Anakin.



(d) The hint and the timer are displayed to Anakin.

Figure 1. Scenarios' flow of a collaborative quiz game.

After selecting and sending the hint, it will appear on his colleague screen, beneath the area with the question, with the timer next to it (Figure 1d).

All mentioned aspects such as the questions, the topic, the scores, the times to answer, the rewards, the penalties and the actions to log, could be defined by the teacher while developing the game with Epik. Moreover, the development of these games will be a simple task for the teacher, as their integration in Moodle.

3. CONCLUSION

With collaborative quiz games we can develop and improve students skills related to the: (i) **learning topic**, since they must answer related topic questions, using the information provided in the game, or possibly the help provided by others. Besides that they can also help other students by choosing adequate hints or by removing incorrect answers. In both cases the students can acquire and improve their knowledge about the game topic; (ii) **teamwork**, in order to finish the game, students must collaborate, which improves their teamwork capacity.

The competition component introduced by the game scores also motivates the collaboration between students and improves their motivation to learn. In addition, the teams' ranks stored by Epik also motivate students to play again and to get better results.

ACKNOWLEDGEMENT

The authors would like to thank the FCT/MCTES, Pest-OE/EEI/UI0527/2011 Centro de Informática e Tecnologias da Informação (CITI/FCT/UNL) 2011-2012, for the support given to this work.

REFERENCES

Moreno-Ger, P. et al, 2008. Educational Game Design for Online Education. *Computers in Human Behavior*, Vol. 24, No. 6, pp 2530–2540.

Sampaio, B. 2012. Epik, viewed 21 September, 2012, <http://asc.di.fct.unl.pt/~cpm/epik/>.

Sindre, G. et al, 2009. Experimental Validation of the Learning Effect for a Pedagogical Game on Computer Fundamentals. *Education, IEEE Transactions On*, Vol. 52, No. 1, pp 10–18.

Torrente, J. et al, 2009. Integration and Deployment of Educational Games in E-learning Environments: The Learning Object Model Meets Educational Gaming. *Educational Technology & Society*, Vol. 12, No. 4, pp 359–371.

Zea, N. et al, 2009. Design of Educational Multiplayer Videogames: A Vision from Collaborative Learning. *Advances in Engineering Software*, Vol. 40, No. 12, pp 1251–1260.