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Educational Leisure on a Mobile Phone Using Quick Play

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Abstract: Since the first public release of cell phones in 1977, cell phone usage has grown at a rapid pace. The popularity of cell phones has also led to an increased demand for useful wireless and mobile applications. Mobile gaming is one major application area. Although, many mobile games have been developed, the literature implies that there are relatively fewer games that are designed to be educational. Short mobile games are often played when users find themselves seeking a distraction from an otherwise dull situation for example waiting or commuting. A mobile game that promotes learning provides an educative diversion in these spare moments. This may be particularly useful for students who have free periods between classes. This study proposes an educational mobile game based on dynamic data sets. The data used for driving the game can be dynamically communicated between the phone and another device so that users receive regular updates. The content for the educational application is flexible but must also follow certain rules so that the gaming system can read the data, process it and present it to the user. The educational game proposed can easily be applied to other courses as well once certain specifications are followed.

Key words: Mlearning, edutainment, elearning, mobile game development, SMS, blue tooth

INTRODUCTION

There is currently an estimated 4 billion cell phone subscribers worldwide. According to Kurkovsky (2009), a modern college student would hardly be able to imagine living a life without spending a considerable amount of time with a cell phone. The ubiquity of mobile devices has inspired much interest and development in the area of mobile games and applications within recent years.

Since the first mobile game, Snake was developed by Nokia and deployed on selected mobile phones in 1997 (Nokia), many more mobile games have been developed. Snake and its variants have since become the most-played videogame on the planet with over a billion people having played the game (Elspca). However, there are relatively fewer mobile educational games than other types in existence. The benefits of a mobile game are linked to the benefits of a computer game (Barnes *et al*., 2007). They have shown that computer games can improve recruitment and retention by capturing students' enthusiasm. Casual games, the category in which the application falls are usually played in short bursts: during class breaks, waiting in a line or waiting on transportation (Koivisto, 2006).

Literature review: There have been other attempts at using gaming for teaching. Puzzle games are widely popular (Telephia, 2006) and the intended game is a mixture of this genre and trivia/word game type Explore!. Costabile *et al*. (2008) explains how a mobile game can be used to teach archaeology using learning by gameplay. The overall importance of learning technology is explained by Yordanova (2007). Basic characteristics, advantages and existing challenges to learning are shown in the study. Kurkovsky (2009) showed how students learning could be engaged in Computer Science courses from an early stage by the use of mobile games. The mobile games helped students to better relate to course material and make stronger connections to real world applications and gadgets they see in use everyday. His use of mobile games was an attempt to solve the overall falling interest in CS as a discipline. The benefits of gaming as an educational tool has also been discussed by Morrison and Preston (2009), Barnes *et al*. (2007), Bayliss and Strout (2006), Beaubouef and Mason (2005), Burd *et al*. (2007), Chamillard (2006), Chao (2006) and Claypool and Claypool (2005).

Mobile games popularity is supported by the attempts in the literature to improve mobile game features and functionality. Akribopoulos *et al*. (2009) discuss how to develop multiplayer pervasive games and networked interactive installations using ad hoc mobile sensor nets. Zyda *et al*. (2008) showed how voice modality could be enabled in mobile games through Voice XML. Matyas *et al*. (2008) discuss the designing of location based mobile games to collect geospatial data with City

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Explorer. Shown such keen interest in the area of mobile game development, the study attempts to use the gaming interest for educational purposes as well.

Game details: The game follows observations by Koivisto (2006) in that users do not have much time or patience to concentrate on long play sessions at a time so playing the game can involve the playing of many short game sessions instead of a few long ones. The game uses short play sessions.

When the user launches the Quiz Master game he is shown with the Games Menu. This is a list of the different games available. QuizMaster currently supports two games; Name that object and Fill in the blank. These two very simple games accommodate a wide variety of topics and can be used by instructors of different fields.

Name that object: Within a predetermined time interval, say 2 min, the user is shown a series of images related to a topic, one at a time. If he correctly names the object featured in the image he is shown another. The game terminates when time runs out or the user correctly names all objects for this topic. The user gains points for each correctly named object.

Fill in the blank: Within a predetermined time interval, say 2 min, the user is shown a series of sentences related to a topic, one at a time each with a key word omitted. If he enters the word that correctly completes a sentence he is shown another. The game terminates when time runs out or the user correctly completes all the sentences set for this topic. The user gains points for each correctly completed sentence.

It is clear that these two games are very flexible and content can be diverse. Name that object can be used to quiz students on any topic where image recognition is key for example Geography, Biology or even Foreign Languages. Fill in the blank can help aid students revision of definitions and fundamental concepts. Clearly this can be applied to a multitude of subject areas. Repetition is an important aspect of learning and frequent play can help students become familiar with and remember certain topics. Also, the games can be played by anyone of any age who enjoys mobile games. When the user selects a game is shown with the following menu as shown in Fig. 1 and 2. If the user selects Fill in the blank and then New Game as shown in Fig. 3.

The user must enter his answer in the space provided and select Enter. If he is correct he is shown with another sentence otherwise the field for data input is cleared and he can retry. The Gauge object, Timer, lets him know much time is left. A Gauge shows the progress of an activity. A Timer keeps track of elapsed time and can be attached to

Fig. 1: Quiz master main games menu

Fig. 2: Main menu

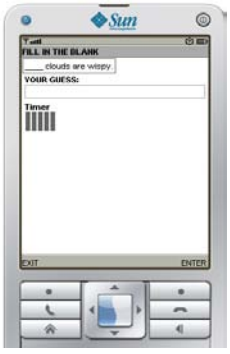

Fig. 3: Fill in the blank session

a Gauge object. If the user selects Name that object and then New Game as shown in Fig. 4. The user must enter his answer in the space provided and select Enter. If he is correct he is shown with another sentence otherwise the field for data input is cleared and he can retry. The Gauge object, Timer, lets him know much time is left. When the user selects high score on the menu for a game, he

is shown with the screen as shown in Fig. 5. The highest score achieved by the user in each topic is saved. This can indicate to the user which are his stronger topics and which need more attention.

Application of principles to other scenarios: It was mentioned before that the game can be applied to teach material in other areas. One useful area is for revision of Information Technology concepts (Fig. 6) for ordinary level examinations. Multiple choice questions can be shown which test basic terminology and concepts.

Shown that students may get tired of traditional teaching mechanisms, the mobile phone as an e-learning device may very well be welcomed by young students. A feature can be included for tougher questions where a Bluetooth SMS text can be sent to another user and a response solicited. Such an architecture is shown in Fig. 7. Users have to be within a certain range. The

Fig. 4: Name that object session

Fig. 5: Highscore screen

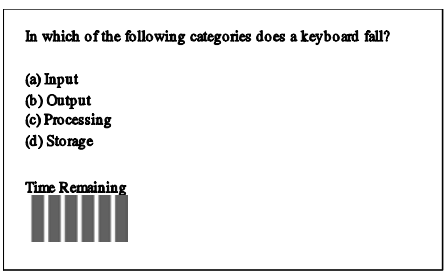

Fig. 6. Sample information technology test screen

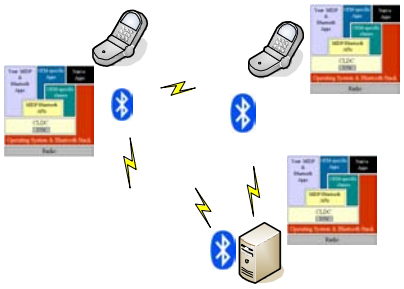

Fig. 7: Sample bluetooth architecture

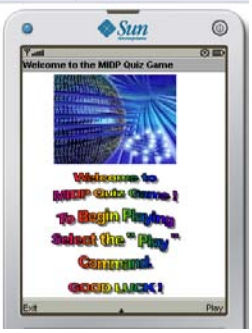

Fig. 8: Sample Midp quiz

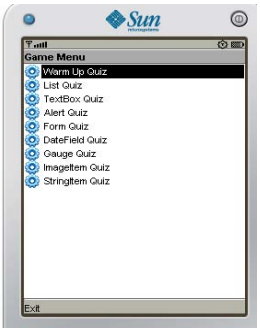

Fig. 9: Screen activated when Play is selected

Fig. 10: Screen activated if Warm-Up Quiz is selected

Fig. 11: Starting the Warm-up quiz

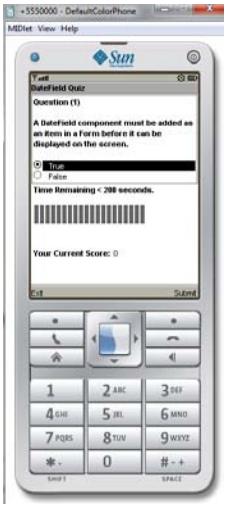

Fig. 12: Date Field quiz

architecture rectangular box shows where the application or MIDP program would reside. Note that normal SMS can also be used, paying attention to the character limit of such a system. The application of our ideas can also be applied to wireless elearning tutorials. The sample screen as shown in Fig. 8-12 can be the main launch screen that leads to subsequent sub-topic screens.

CONCLUSION

A mobile game has been developed that attempts to provide educational leisure during times when a user has a few minutes to spare. The application is flexible in that it can easily be applied to many subject areas and played by a wide age group. This has been partially demonstrated. Lecturers and other educators can use this approach to feed short quizzes to students' mobile phones. Once a user has mastered a topic it is very likely that user will lose interest in the game.

RECOMMENDATIONS

Future works will show how the game content can be modified by connecting to another device and demonstrate the use of dynamic Record Stores in wireless Java programming.

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