A Scenario Editor and Authoring Tool for a Low Fidelity Cultural Competence Serious Game

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Abstract Despite the computational resources present today, rendering high fidelity real-time graphics is a computationally intensive task. Although designers and developers of virtual learning environments typically strive for high fidelity graphics, evidence suggests that high fidelity graphics does not always lead to greater learning. Here we describe work in progress that is seeing the development of a medical-based cultural competence serious game called Fydlyty, that focuses on a low graphical fidelity design. Building upon our prior work, here we describe refinements to Fydlyty's scenario editor, and the dialogue authoring tool to address two different categories of users' (i.e. educators, and students).

Keywords: Serious games, scenario editor, authoring tool, realism, fidelity

1 Introduction

Not too long ago the primary purpose of video games was to provide personal and social entertainment, but this trend has gradually changed. With the tremendous amount of scientific research conducted regarding the use of games for educational purposes, the potential value of video games for learning is very prominent [1]. A subset of videos games known as serious games have been re-appropriated for educational and training purposes [4].

We have recently introduced Fydlyty, a web-based serious game for medicalbased cultural competence education [3]. In this paper, we introduce a dialogue authoring system that improves Fydlyty by provides educators/instructors a simple interface to develop and/or modify specific cultural competence based scenarios. We also discuss a novel debriefing method that includes recording a player's gameplay session, uploading the resulting video to an educational networking site, and having other users (i.e., other students) comment on and question the player's actions as depicted in the gameplay video.

2 Background

In the field of medicine, serious games can be used to facilitate enhanced communication, and can help avoid conflicts in a clinical environment. Conradi

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2 Zain Khan and Bill Kapralos

et al. [2] proposed a 3D immersive environment to create virtual patients in a virtual world. This 3D environment is suitable for work-based learners who are at different physical locations. In contrast, the SeGAE (Serious Game Authoring Environment) [6] is an author friendly environment that offers the instructors a set of editors to define virtual characters' (VCs) characteristics, mission objectives, win or loss conditions, and authorized actions in each mission. Using the SeGAE, the designer can modify and reuse existing modules of the framework to produce a new serious game.

3 The Fydlyty Serious Game

The Fydlyty serious games, intended for medical-based cultural competence education, was recently introduced [3]. Here we build upon and improve the original game environment by providing greater freedom to those using its scenario editors (i.e., educators and curriculum designers). In the subsequent sections greater details are provided regarding the new design with respect to: (i) the game users, (ii) the scenario editor, (iii) the dialogue authoring tool, and (iv) debriefing.

Game Users The game consists of two different types of users (i) educators/curriculum designers, and (ii) students/trainees. The educators are the privileged users who can create scenarios, modify dialogue scripts, and assess the overall progress of each student. On the contrary, the students are the game players who take the role of the character (a medical professional such as a doctor or nurse), assigned to them by the educators, and play the game.

Scenario Editor The scenario editor design (see Fig. 1), is based on: (i) background, (ii) characters (whose mood can be either normal, upset, or angry), (iii) script, and (iv) role of the game player. The background, and virtual characters are represented by images (JPEG or PNG) which are rendered at the interface level. Each characters' image represents an aspect of the mood (i.e., normal, upset, and angry) of the VC. As the conversation moves forward, and the mood of the VC alters, the image expressing the new mood replaces the previous image. This provides the game player with a sense of achievement (when the mood is positive), or concern (when the mood is negative).

The script that each scenario is based consists of the: (i) context, (ii) scene, and (iii) dialogues. The context describes the circumstances that form the setting of the event so that the game player can fully understand and assess the environment. The scene describes the characters involved in the event and the place where it will occur. Finally, the dialogues, which are uploaded using a comma-separated version (CSV), describe the narrative between the game player, and the VC are described in greater detail in the following section.

Scenario Title *	Doctor - Patient	Game Player *	Doctor
Background Image	Browse BGROUND_01.jpg	Virtual Character *	Patient
	<u></u>	Dialogue Script *	Browse dialogue.csv
		Context	This scenario involves a man meeting with his
Character Name	Jade Wilson		doctor to discuss his heart and liver health. The man doesn't feel comfortable with his doctor so he brings along a friend to help him through the
Character Role	Patient		experience. He doesn't like going to the doctor for a number of reasons:
Gender	Female Y		He is nervous that he will not understand
Marital Status	Widowed ~	Scene	Mr. Jordan and his friend walk into the doctor's office. The doctor is sitting at his desk that faces
Mood Normal Image *	Browse NORMAL_02_PNG.png		the wall. Mr. Jordan and friend sit at the chairs nearby facing slightly away from the doctor. They
	-		will have to turn their heads to look at him. Mr. Jordan does not introduce his friend in spite of the Doctor seeming to want the introduction.

Figure 1: Scenario editor. A variety of compartments are available to the educator to develop a scenario.

Dialogue Authoring Tool The dialogue authoring tool has two purposes: (i) manage dialogues in the database, and (ii) propose different variations of each dialogue. When the CSV file containing the original dialogue script is uploaded, each dialogue is saved in the system with reference to its parent. Once completed, the dialogue authoring tool will then create different variations of each sentence stored. The dialogue authoring tool refers to a predefined list of phrases that it uses to replace the original phrase with. Depending on the number of alterations, the new mood (upset or angry) is estimated. One such example is shown in Fig. 2 where the doctor (game player) replies to the patient (VC) by mistakenly referring to her as "Mr. Wilson" rather than "Mrs. Wilson". At this point, the VC's mood changes to "upset" while the game player's score decreases.

Proposed Dialogue Script						
Character type	Normal	Upset (Proposed Dialogue)	Angry (Proposed Dialogue)			
Virtual Character	Hello doctor! Can you spare me a few minutes?					
Game Player	Good morning Mrs. Wilson. Come in and sit down. Now what is the matter with you?	Good morning Mr. Wilson. Come in and sit down. Now what is the matter with you?	Good afternoon Mr. Wilson. Come in and sit down. Now what is the matter with you?			
Virtual Character	I seem to be generally out of sorts. I have no appetite for my food and yet I am always suffering from indifestion.					
Game Player	Are you troubled with headaches?					

Figure 2: Proposed dialogues for upset, and angry mood based on the original script.

Given that the game is still under development, every possible dialogue does not have an associate version. Furthermore, it cannot be expected that each version of a dialogue will be completely correct. To overcome this issue, each dialogue (as shown in Fig. 2 for example), is editable, and it is the educator's

Create a new scenario

4 Zain Khan and Bill Kapralos

added responsibility to ensure that the final dialogue script is grammatically, and factually correct.

Debriefing At the end of the game, rather than just showing the correct options that the game player selected and could have selected, we employ the online educational networking web site OPEN (Observational Practice and Educational Networking) [5] to facilitate debriefing, and assess the game play. Here the game player can upload his/her instance of the game (e.g., gameplay session video), and other users' can comment on (and question) the player's actions as depicted outlined in the gameplay session video.

4 Summary and Future Work

Here we described recent improvements to the Fydlyty medical-based cultural competence serious game. Fydlyty facilitates the dialogue between a game player and a VC allowing cultural barriers to be examined. Future work includes improvement of the design for the dialogue authoring tool, and the inclusion of audio (speech) to increase the fidelity of the VC and measure its effects on learning.

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References

- Becker, K.: How are games educational? learning theories embodied in games. In: 2005 DiGRA International Conference: Changing Views: Worlds in Play (2005)
- Conradi, E., Kavia, S., Burden, D., Rice, A., Woodham, L., Beaumont, C., Savin-Baden, M., Poulton, T.: Virtual patients in a virtual world: Training paramedic students for practice. Medical Teacher pp. 713–720 (2009)
- Khan, Z., Maddeaux, K., Kapralos, B.: Fydlyty: A low-fidelity serious game for medical-based cultural competence education. In: 8th International Conference on Intelligent Technologies for Interactive Entertainment (INTETAIN). pp. 1–5 (2015)
- van Est, C., Poelman, R., Bidarra, R.: High-level scenario editing for serious games. In: International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications (GRAPP 2011). pp. 339–346 (2011)
- Welsher, A., Kahn, Z., Rojas, D., Bernard, C., Musson, D., Brydges, R., Dubrowski, A., Kapralos, B., Grierson., L.: Observational practice and educational networking: Connecting clinical skill learners across a distributed medical education network. In: 2014 Ontario Simulation Exposition, Toronto, Canada, December 4-5. IEEE
- Yessad, A., Labat, J., Kermorvant, F.: Segae: A serious game authoring environment. In: 2010 IEEE 10th International Conference on Advanced Learning technologies (ICALT 2010). pp. 538–540 (2008)