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Technology-enhanced role-play for social and emotional learning context – Intercultural empathy

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ABSTRACT

Role-play can be a powerful educational tool, especially when dealing with social or ethical issues. However, while other types of educational activity have been routinely technology-enhanced for some time, the specific problem of supporting educational role-play with technology has only begun to be tackled recently. Within the eCIRCUS project we have designed a framework for technology-enhanced role-play with the aim of educating adolescents about intercultural empathy. This work was influenced by related fields such as intelligent virtual agents, interactive narrative and pervasive games. In this paper, we will describe the different components of our role-play technology by means of a prototype implementation of this technology, the ORIENT showcase. Furthermore we will present results of our evaluation of ORIENT.

1. Introduction

Drama and play have been used for education for a very long time [9] and have resulted in game-based educational approaches. These provide a means of overcoming real-world social restrictions, placing the player in a role that may or may not be socially acceptable in real life, such as a medical doctor or a thief. Games allow the player to escape into fantasy worlds, encourage exploration of exciting things, people, and places that are otherwise inaccessible in the real world, inducing a 'suspension of disbelief' in the player. Learning often takes place while the game is played, with immediate feedback. The subject to be learned is directly related to the game environment where constant cycles of hypothesis formulation, testing and revision are evoked as the player experiences continuous cycles of cognitive disequilibrium and resolution.

This paper explores an approach to an educational role-play (RP) game developed in the ORIENT showcase of the eCIRCUS[1] project, employing innovative technologies to foster social and emotional learning in the adolescent age group. With globalisation, dealing with cultural difference and diversity has become a widespread task and is both challenging and enriching. Several studies show a coherence between experiences of discrimination and mental stress, lower well-being and symptoms of depression [47,35]. Beside risk factors, protective factors need to be regarded and developed. Although several international preventive approaches for social integration of underage migrants already exist [45], ORIENT will add an innovative approach.

Acculturation is defined as a long-term, complex, multidimensional process with the aim of participation in the society of settlement; it is initiated when individuals and groups are in permanent contact with another culture and it leads to a change of the original cultural pattern of both groups as a consequence of persisting contact [5,6]. Determinants of integration are to be found on the societal level, on the level of subgroups in society, and on the individual level. Individual characteristics that influence acculturation (as tackled through educational software like ORIENT) are:

- *Prior to acculturation:* age, gender, education, motives for migration, cultural distance.
- *During* acculturation: language skills, attitudes, coping resources, social support/discrimination, prejudices.

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[1] http://www.e-circus.org/.

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In looking for ways to help the process of acculturation of adolescents from immigrant backgrounds, there were a number of reasons for not focusing on them directly. Firstly, they form a heterogeneous group with a multitude of cultures and languages. It would be infeasible to try to capture all these in a computer-based system. Furthermore, acculturation is a two-way process in which both the incoming group and the host group have to negotiate a common understanding. It was therefore decided to focus on the host group, and to foster intercultural sensitivity through the development of intercultural empathy. This seems particularly necessary where the public discourse is often so hostile to incomers. By increasing the social and intercultural competence of the host adolescents, ORIENT aims at diminishing discrimination and hence lowering the mental stress of peers from a migration background.

ORIENT's role-play relies on the stages of Intercultural Learning proposed by Grosch and Leenen [16] and on the Levels of Intercultural Sensitivity proposed by Bennett [3,4]. We focus on the exploration of another (virtual) culture and on the reflection of similarities and differences between the own and the foreign culture – relate to a subset of Bennett's stages: acceptance and adaptation. ORIENT should lead the learners to understand how to explore a culture and to understand that thoughts and feelings are culturally driven.

Through role-play, new schemas representing attitudes and actions will develop within the host adolescents as they act out new roles [26]. Role-play thus supports experiential learning emphasising the importance of a direct encounter with the subject of study "rather than merely thinking about the encounter [with the subject], or only considering the possibility of doing something about it" [7]. ORIENT offers a virtual role-play environment inhabited by autonomous artificial agents that interact with and react to a group of learners. Within this artificial context, new elements of behaviour can be performed without causing conflicts with existing behavioural schemas – behaviour is not demonstrated in reality, but under "as-if" conditions in a secure environment [25]. The testing of new behavioural strategies is immediately followed by feedback from the virtual environment serving as a source of information for the learners about the appropriateness or suitability of their actions. Hence, learners can collaboratively improve their perception of and alter their emotional reactions and attitudes to members of other cultures, while interacting with the virtual environment through a set of engaging and immersive interaction devices.

The rest of this article is organised as follows: we start by reviewing related work in pervasive games. This is followed by a description of the game, ORIENT, focusing on the background story, the current prototype and the cultural element. Section 4 provides a description of the system components while Section 5 details an example scenario in the game. Next, an evaluation of ORIENT is presented in Section 6 including the methodology, aims, results and discussion. Section 7 concludes the paper.

2. Related work

Pervasive gaming takes virtual narrative elements out into the real world, focusing on introducing game elements into the everyday life of players. They exploit interaction devices such as handhelds to display virtual world elements [2] and employ technology support through which human game-masters can exercise higher amounts of control over the game experience [42]. The enhanced reality live role-playing of the IPerG project, in the area of pervasive games, has successfully carried out a number of pervasive games in real spaces [34]. These focused on the idea of linking the real world into the story world [43], through for example, using unwitting inhabitants of the real world as props for pervasive game players. Some other groups have also produced educational pervasive games. Virus [8] is a game in which learners take on the role of a virus and transmit it via specially-designed mobile devices called Thinking Tags by getting within proximity of other users. This demonstrated a complex disease-propagation algorithm in a real world setting. In Paranoia syndrome [19], learners can take on the roles and skills of a technician, doctor or scientist. The Virtual Savannah [2] took child learners out of the classroom setting and through the use of handheld devices made it possible for them to view their school playing field as a Savannah on which they role-played lions. A more recent and more problem-oriented role-play, the Environmental Detective [27] used a whole university campus as its story-world, while artistically oriented pervasive games such as Uncle Roy All Around You and I Can See You Now [2] have used whole cities as the game environment.

The use of large-scale real-world spaces for role-play suits some applications, but others require a dedicated space, and can be thought of as stage-based role-play. This is true of many of the existing educational role-plays. A stage-based environment can be thought of as a sensor-rich pervasive computing environment including large display systems in which virtual actors and graphical worlds can play a more prominent role than is feasible when only hand-held devices are used. An early example of the stage-based approach is the Mission Rehearsal Exercise [20] in which a single human participant interacts with virtual characters in a stressful and dramatic situation (peacekeeping) using structured speech. This work has been extended into a more augmented reality environment using 'flats' – large display screens within a real world space, but has limited interaction modalities. ORIENT also takes this approach for a role-play that aims to educate students in inter-cultural empathy employing a set of innovative interaction devices.

3. The game: ORIENT

3.1. The story

ORIENT was developed for the 13–14 age group of boys and girls and our initial prototype was customised for British and German users. However, it could be easily localised to different languages. It is designed to be played by a group of three teenage users where each one of them takes on the role of a member of a spaceship crew and is responsible for a different interaction device with specific functions. Their mission takes them to a small planet called ORIENT, which is inhabited by an alien race – the nature loving Sprytes. Portraying a fictional instead of an existing culture makes our application more flexible and suitable for users from diverse backgrounds. Furthermore, it allows us to exaggerate cultural differences for dramatic and educational purposes.

The Sprytes are not aware of the danger that their planet is in: a meteorite is on destruction course and unless someone stops it, it would mean the end of life on ORIENT. It is the users' task to prevent a catastrophe. To do that the users first have to befriend the Sprytes and ultimately cooperate with them to save their planet. Through interaction with the Sprytes, ORIENT promotes cultural-awareness in the users, who have to put themselves into the shoes of guests in a strange and unknown culture. At the same time ORIENT acts as a team building exercise where users play as a single entity rather than as individuals. All users have the same goal in the game although their roles and capabilities differ.

3.2. The ORIENT prototype

A prototype of ORIENT has been implemented consisting of the main components shown in Fig. 1. Each component will be