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e-Quino: an Interactive Videogame to Complement Equine Therapy

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Abstract:

e-Quino project is a video game that recreates the AAT (Animal-Assisted Therapy) performed with children and teenagers with neurological development disorders, at "Centro de Equitación para Personas con Discapacidad y Carenciadas" (CEDICA) of the La Plata racecourse (http://cedica.com.ar). In particular, e-Quino will be focused on equine therapy performed at CEDICA. e-Quino is a single-player game that uses an immersive virtual environment built on the Unity3D[5] game engine. The goal of the game is to improve the emotional state, the memory, the cognitive functions and the well-being of the student-patients. A multidisciplinary team composed of psychologists, educators, doctors, programmers and designers specialized in 3D art, is currently developing e-Quino. Factors such as requirements, emotional responses and the profiles of student-patients are being considered for this development. Field tests will be performed on a total of 24 student-patients.

One Sentence Summary: eQuino is the first version of a serious game to recreate the feeling of well-being equine therapy gives to CEDICA student-patients, whenever the actual activity cannot be performed.

Main Text: Equine therapy uses the horse in a therapeutic manner and constitutes an integral therapy that aims at the recovery of patients in their biological, psychological and social dimensions. Equine therapy seeks to provide patients improvements in visual attention and enhance their concentration and understanding response skills, among others [1,2].

CEDICA is an equestrianism center specialized in equine-facilitated therapy in the city of La Plata. Currently, CEDICA has over 100 student-patients from all over La Plata and nearby cities, and from very different sociocultural backgrounds. In this kind of therapy the horse is the patient's companion. A group of highly-trained therapists participates in every session, including a coordinator, a handler and one or more volunteers. The coordinator is a professional (psycho-motor skill specialist, psychologist, occupational therapist, teacher, etc) with a background in equine-assisted activities and therapy, and whose role is to coordinate the entire work with their assigned student-patients. The coordinator plans and performs activities in the course and directs the rest of the team. The horse handler must prepare the horse for each case with the equipment the coordinator indicates and then direct the horse according to the goals proposed by the coordinator. The volunteers assist in the activity as required, accompany the student-patients, and participate in the activities that the coordinator proposes.

CEDICA patients suffer from moderate to severe neurological disorders or motor disabilities. Both women and men take part in the activities and the sociocultural conditions of the participants are diverse. The rehabilitation activities take part once a week. Taking into account that student-patients go to CEDICA once a week, having a serious game that provides the same general wellbeing as real therapy would be a positive contribution to the completion of their treatment and the seizing of its benefits.

Videogames in health. Videogames were initially developed for entertainment, however, in the last few years, the use of serious games for educational and health purposes have increased significantly. Multiple studies have shown humans react to such interactive design elements positively and cause them feel-good chemical reactions, alter human responses to stimuli— increasing reaction times, for instance— and in certain situations can improve learning, participation, and motivation[3, 4]. The most relevant and regarded as positive characteristics in videogames, such as intensity, isolation from the outside world, immersion and low resistance to

be used by children and teenagers and their positive effect in mental skills made us decide on their adoption as a complementary tool to therapy at CEDICA.

Description of the game. e-Quino is a single-player game that uses an immersive virtual environment built on Unity3D[5]. It is aimed at children and teenagers with neurological development disorders and who are under equine therapy treatment at CEDICA. e-Quino complements this treatment, recreating those activities in the game. The player starts by selecting a horse – it is expected that they select one similar in coat and build to the real one. Following, the player is led by the team of therapy assistants to perform six activities with increasing complexity. Each activity provides congratulatory feedback to the player to emphasize their achievement. If the game detects that the player is straying from the goal of the activity, it is pointed out to them in a mild, non-traumatic manner.

The initial activity shown in Figure 1 consists of guiding the horse, walking, past a mound in the terrain. Next, the player must guide the horse, this time at jog, through the main course without changing the gait.

Figure 1 – Activity 1: the player guides the horse past a mound

The next activity shown in Figure 2 consists of riding the horse in an area delimited by ground-level fences without deviating to the sides. At this point, the player has reached the level of medium complexity, where the next goal will be to choose an object of a certain color from a basket and take it to the indicator of the same color across the field.

Figure 2 – Activity 3: the player rides the horse through a fenced area

The next goal will be to zigzag through multiple elements lined up in the terrain, as it is shown in Figure 3.
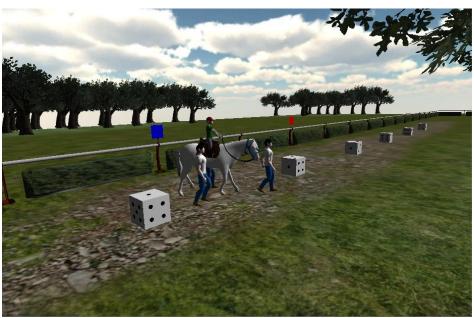

Figure 3 – Activity 5: the player zigzags through the elements

The activity considered as the one with the greatest complexity shown in Figure 4 consists of the player shooting three balls through a ring located at rider height

Figure 4 – Activity 6: the player tosses three balls to a ring located at the height of the rider

The game also allows the player to recreate the activities that they found most pleasant. As shown, the complexity of the proposed activities varies. The game begins with the easiest and gradually increases in difficulty.

Method of evaluation. During the first stage, e-Quino will be tested on 24 patient-students, classified in: 8 patient-students diagnosed with down syndrome, 6 with pervasive developmental disorder, 7 with mental retardation and 3 with developmental delay.

The general testing procedure will consist of the administration of guide surveys before starting a game session with e-Quino and after the session ends. These records will enable detection of the impact e-Quino has in patient-student with different diagnoses in regards to socialization, general well-being, memorization, etc.

References and Notes:

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