REPLAY
3D GAMING PLATFORM AND ITS USAGE IN PSYCHO-PEDAGOGICAL COUNSELLING IN SCHOOLS FOR INFLUENCING THE BEHAVIOUR OF YOUNGSTERS

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Abstract

Nowadays, interactive gaming technology is highly popular amongst young people. By using this as advantage, the vision of REPLAY project is to use this technology as support in increasing the level of awareness of young people in motivating their behaviour, and encourage them to be highly responsible for the consequences of their decisions. The aim of REPLAY project, which involves experts in education, psychology and anti-social behaviour from Romania, United Kingdom and Spain, is to develop a gaming technology platform to provide a learning environment which will facilitate the reintegration in society of young people, who were marginalised by the society as a result of their anti social behaviour.

Keywords: anti-social behaviour, interactive gaming platform, primary and secondary users, REPLAY, intercultural adaptation of content, initial prototype game

What is REPLAY?

The target group of this project consists of young people aged between 10 and 14 years who tend to have anti-social behaviour in formal education environment. REPLAY is a support tool which will be installed and will become part of preventive anti-social behaviour programmes in schools as well as in day centres for youngsters involved in re-education programmes.

Implementation and Management Approach

The gaming platform, consisting of a videogame (software) and a wireless interactive balance board as a primary user interface, will be set in

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schools and run as a part of preventive anti-social behaviour programmes in schools. The platform will be installed as well in day centres for youngsters involved in re-education programmes and will be considered as support tool for professionals (i.e social workers). The teachers, social workers and professionals working in these programmes, manage the gaming platform in terms of content, gaming sessions, review of answers and selection of the educational activities included in the game sessions.

All centres using this instrument have been fully engaged in the game development, in testing and validation phases. All parts involved in these phases were initially trained in special sessions during which they got the required technical skills for using platform's components. These sessions have facilitated the efficiency of all processes during game's sessions. The testing phase had a series of steps specially designed for platform's evaluation from both practical/technical and pedagogical point of view. The first step in the testing phase aimed to assess the platform's functionality and content in order to assure the adaptation level for users aged 10-14 using this technological tool and also, for choosing the game content. The second step aimed to collect and analyze the feedback from testers in order to identify optimal solutions and avoid the bias effects during testing stage and its results. Platform's evaluation was made both by primary users (pupils aged 10-14 years) and secondary users (experts – teachers and university professors). Finally, the third's step aim was to complete an overview on the strengths, weaknesses and recommendations proposed by the testers from three countries (UK, Spain and Romania), which led to the development of a new version of the game, version which was tested later. Therefore, we can say that pre-testing the initial prototype facilitated its development in the testing phase. At this stage of the project, instrument's validation and relevant recommendations were very important in drawing up the game and developing the platform.

There are a number of interrelated success factors which will influence the project result. In the first place, the key challenge is to ensure that consistent testing and validation is carried out in the three end user testing centres. For this, a robust methodology has been developed and communicated to all participants. Secondly, the technology solution presents the possibility for many problems in terms of effective running of the game in each centre. When any of the main component technologies fail, the testing and validation suffer. Thus, to prevent this negative aspect, significant pre-testing sessions have been run within each testing centre and open communication channels have been set up between testing practitioners on one hand, and game developers on the other hand. It is crucial for the final result of the project, to obtain usable and meaningful data from testing and validation, data which will be implemented into the next version of the game prior the final installation of the game in schools or psycho-pedagogical counselling centres.

The game has two phases. During the first phase – **Play** – the game motivates youngsters with the success they get by completing interactive and 3D designed levels of the game. The races in the game contain subliminal educational messages. Players' reactions and decisions during **Play** phase offer the opportunity for teachers and counsellors to choose pedagogical strategies for their interventions on the target group of the project (Table 1).

	TOOLS AND TECHNIQUES	
	CHILDREN	**EXPERTS / TEACHERS / COORDINATORS**
Phase 0: Pre-session		• Training session
	• **ASB** – Allsop and Feldman's scale of anti-social behaviour in the adaptation by Martorell and Silva [1993] • **CE** – Empathy evaluation questionnaire by Mehrabian and Epstein [1972] • **IVE-J** – Impulsiveness, adventure-seeking and empathy scale by Eysenck, Easting and Pearson [1984], adapted by Martorell and Silva [1993]	• **CBCL** – Achenbach, T. M's Child Behaviour Check List, [1991].
Phase 1: Play Session	• Cognitive walkthrough • Breakdown analysis with video-analysis	• Heuristic evaluation check list • Cognitive walkthrough
Phase 2: "Re-play" Session		• "Re-play" observation guide
Phase 3: Post-session	• Motivation questionnaire, Flow/Likert scales	• Motivation questionnaire, Flow/Likert scales
		• Questionnaire on Evaluation of the tool's professional performance value • Focus Group Guide

Table 1. *Assessment instruments used in Replay project*

A very important aspect in users' behaviour assessment is the way they complete the Play Session levels on one hand and the Replay Session on the other hand (the psycho-pedagogical reflection on choices made during the

game). These sessions highlight the coherence between users' sequential behaviour. While in Play session the main objective is to complete the six levels and control the balance board, in Replay session the user is in the situation of reflecting on the content's utility in various contexts. Thus, we can assume that Replay session facilitates personal and social skills' development, skills which related to the benefices they imply in users' adaptation process, could be considered part of a particular domain: cross-curricular skills.

The users were asked to complete all game's levels so they were able to make a record of their progress both individually and assisted by the educational counsellor/psychologist. The framework created by the game leaded to a decrease of the resistance associated to technology handling and facilitated the chance of building a psychological relationship based on reflections, a transformation of the individual emotional frameworks, choices' adjustment to daily life and reconsideration on users' reactions within an outside created environment. This environment allowed primary users (pupils) to adapt and understand their internal registers.

In this research we used both quantitative and qualitative analysis in order to get a complete picture of the situation we studied. Based on experts' and initial users' opinion offered during the first phase of this project (WP1 and WP2), the sample for our research consist of children aged 10-14 years both genders and low anti-social behaviour. This sample was constituted after a several number of pupils completed a questionnaire designed to identify the level of anti-social behaviour (ASB). Finally 120 pupils with low level of ASB – 40 from each participating country – were selected. Moreover, these participants called "primary users" were selected based three more criteria: age (two groups of pupils aged 10-12 years and aged 12-14 years), gender (boys and girls) and finally their level of education (primary level / secondary level) (Table 2). In Romania, there were selected 40 primary users from five different educational institutions located in Iasi – "National College", "Vasile Alecsandri" Highschool, "Vasile Conta" School, "Bogdan Petriceicu Hasdeu" School and "Nicolae Iorga" School.

	PRIMARY USERS				**TOTAL**
	BOYS		**GIRLS**		
	10-12years	12-14 years	10-12 years	12-14 years	
Primary school	30	-	30	-	60
Secondary School	-	30	-	30	60
TOTAL	**30**	**30**	**30**	**30**	**120**

Table 2. Sample distribution – Primary users

	SECONDARY USERS		TOTAL
	EXPERTS	TEACHERS	
	Psychologists, Occupational Therapists, Social Workers	Teachers who teach in primary and secondary schools	
TOTAL	**18**	**18**	**36**

Table 3. *Sample distribution – Secondary users*

Technological solution

The Replay project aims to use the popularity and the interest that video gaming has, as advantage in creating a tool which will help experts to understand youngsters' anti-social behaviour. A 3D environment and an interactive game were developed to introduce the user in a race against the clock through a futuristic world. By integrating in a pedagogical framework interspersed "play elements" and a series of specific activities, each user's decisions and values were highlighted during the game. Each activity within a level had to be completed before the user could continue the next level.

Once completed this highly playable game and all its embedded activities, the application moves to the main menu of the game which allows the expert to discuss the specific responses given by the player during each activity and creates the opportunity for an open and honest dialogue about values and behaviours. This dialogue has shown users' opening in sharing the learning experiences they had in other environments than school. Therefore, we can assume that Play-Replay sessions represent modes to access the internal frame of the user who is in the position to offer a new vision of his/her reality and to reflect on the choices made during the game and to facilitate cognitive transfers from game's situations to real life situations.

During play sessions, the psychologists recorded users' behaviour by referring to specific dimensions: achieving game's task without diminishing its playful nature, user's focus on the task, provocative nature of the game which facilitates skills development, user's control over actions and choices, understanding the game's objectives, immediate and understandable feedback, how involved is the user during his progress in game's levels and when concern regarding the time disappears. All these dimensions give methodological consistency to this game and offer a permanent report on the impact Replay has to the user.

Main Technologies developed and integrated

The technologies developed and integrated in the REPLAY Gaming Platform are:

- 3D Video Game integrating multimedia content/activities related to anti-social behaviour;
- Interactive and wireless balance board for game control;
- A range of interactive systems for playing sessions (wireless board, PAD, Joystick, keyboard);
- A user recognition system designed to improve the way user interacts with the system and to increase the level of implication.

Impact, innovation and results

The primary stakeholders of the REPLAY project (beyond the project partners) are the end users. As the project is currently in the middle of the testing phase, the impact on these end users will not be fully known until all results from this process have been collated and analysed. However, we do have some early indicators on how the project may have an impact on the work of teachers and professionals working with marginalised young people and, as a consequence, what the impact may be on those youngsters.

First of all, the findings suggest that Replay will become a valuable part of the programmes preventing anti-social behaviour; there are very few similar products on the market. Furthermore, the financial costs of developing highly immersive video games are minor when compared to the ones for the development of this sort of niche games. By focussing on anti-social behaviour and creating a genuinely playable, immersive game, Replay has the potential to bring significant value to all professionals working with marginalised young people from all over the world. The potential of the technology to let young people express themselves and to create a genuinely "youth friendly" context which in normal situation is difficult, is already proven. By creating this environment and by providing the appropriate follow-up tools, young people at risk of being marginalised due to their behaviour, can be helped onto a more positive path. Children's involvement has already been proved by their gaming experience. Replay is offering an educational framework which can build premises for psychological counselling. The risk of becoming addictive to this game is very low because play session (the user runs through six work activities using the platform) is only an anchor in developing a Replay session which depends very much on psychologist's skills. Therefore, we can say that Replay is a challenge for any type of user (student or expert / professional).

This challenge is primarily determined by the opportunity Replay has in diversifying the range of game devices, which allows user's immersion observable (especially for boys between 10-12 years). Following some

conducted tests a development of reflective capacity of users was clearly noticed. This allowed an analysis of driving behaviour in relation to the specific type of temper reactions. User's choice regarding the route, the chosen speed during the game were indicators for experts in the process of measuring time during which youngsters made their moral choices. Meanwhile the user had to reflect on his emotional reactions caused by failure or success. User's manner in completing game's activities facilitated the process of forming a perception of the real reasons which can determine the success. Also, this aspect helped him to elaborate real allocations to the success and the failure.

For project partners, the technology creates a number of positive opportunities for further development and also for commercialisation. The gaming platform itself has been built in a modular way to facilitate easy replacement of content and activities. This means that many different versions of the game can be developed cheaply and quickly therefore opening up a huge range of market opportunities beyond the behavioural sector (some of which are already being explored). There are many other application areas that can be explored including games for autistic children, language-learning games, soft-skills games and so on. In addition, the project has also created a wireless component – "human joystick" – which increases the immersion of the player in the game by adding a physical element to the game play. This component can also be used in conjunction with other games on other platforms and therefore represents a further benefit to the project partners.

By using the platform, we can say that an opportunity is created in order to harmonize the body with the mind, since it determines the development of specific skills: the ability to easily see failures in the use of game devices, the ability to put body movements in the form of mental schemes, the ability to control fine movements of the body, the ability to recognize physiological and psychological reactions caused by the use of the game, the ability to make comparisons and to measure progress, moves coordination ability, ability to predict images related to success and determine performing behaviour, ability to interact and to accept adult's presence during learning process, physical ability to transfer physical acquisitions from game environment to social and school environment.

Replay Project is the first experiment using a game as a preventive tool in a program which aims to combat anti-social behaviour in schools but also in the re-education programmes. It could be a reference for other initiatives related to the use of video games to support prevention programs and treatments for youngsters which are likely to be marginalized.

Even if in the last years the market for so-called "serious games" has grown rapidly, there are many aspects to analyse on what contributes in designing a successful educational game.

The dynamic between the game and the embedded pedagogical content is critical for success of a game like Replay. Furthermore, the game itself needs to be designed at a level which makes the player think and feel that it is both, hard enough to be a challenge and easy enough to complete. In addition, a game like Replay will not be played continuously or for long periods of time by the player, it is designed to be played in collaboration with a teacher or expert as part of a wider programme. This makes it fundamentally different (as a game) from the sorts of games that young people are used to play and which are based, predominantly, on the assumption that the player will have many hours if not days to master the different levels of the game.

Conclusions

What type of tool is Replay - an assessment or a treatment one?

- It is a tool that will help professionals to understand and adequately address youngsters with anti-social behaviour;
- Can be used as a starting point for discussions between the player and a professional (psychologist, counsellor or teacher), leading to therapeutic results;
- It is an assessment tool since it allows understanding the motivations and feelings of people involved in a game context. This background could be significantly more effective in causing open and frank responses to questions and dilemmas presented. In addition, this approach does not restrict the use of the game as a starting point for a therapeutic purpose.

Who is playing it?

The target group of this project consists of young people aged between 10 and 14 years who tend to have anti-social behaviour in formal education environment. Motivation for choosing this group:

- Most effective way to link with anti-social behaviour is to address problems as early as possible;
- While child's age increases, the expression of anti-social behaviour becomes more serious and the effectiveness of interventions becomes less secure;
- Number of young people who have different types of anti-social behaviour is much lower than those who have serious forms of ASB;
- Young people aged 10-14 pass through a significant period of personal transition – puberty, changing different levels of the school, etc.
- Anti-social behaviour is more common among boys than among girls. However, Replay will be developed so that it can be applied to subjects of both sexes.

What is the motivation for selecting certain ASB behaviours by REPLAY?

- There is no scale that presents these behaviours gradually, which starts with low-level events and ends, eventually, to criminal events;
- Low-level event is repeatedly described as an "early indicator" of the occurrence of more serious problems which will may appear later in adolescence and adulthood;
- Low-level expression of ASB is very common in schools and communities and represents most of the incidents of anti-social behaviour. Therefore, using prevention is better (and even cheaper) than making therapy to solve this kind of difficulties.

What kind of exercises and activities (content) have been included?

- Those who have the opportunity to be carried out in multimedia format in order to take advantage of 3D multimedia applications;
- Those that ensure compatibility between the 3D game and the specific activities of educational intervention (video and audio files).

Currently, Replay videogame prototype is already developed and distributed to all partner countries. In the WP3 phase, Replay has been tested on three samples of children and teachers based on a complex and unique methodology in the three partner countries.

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