Developing social interaction skills in serious games virtual work environments

Project Acronym: iSpectrum

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0. Introduction

iSpectrum aims to improve the work-based social interaction skills of people with Autism, Asperger syndrome and other related special needs through a virtual work environment serious game to increase their chances of gaining employment.

iSpectrum is funded through the Leonardo programme and is part of the Leonardo Transfer of Innovation stream (TOI), which supports the development of skills and training. Leonardo is part of the European Commission's Lifelong Learning Programme.

The aim of TOI is to improve the quality and attractiveness of the European Vocational Education and Training (VET) system, adapt and transfer best practice and innovation in VET to new contexts, produce tangible products and integrate results into training systems/practices at geographical, sector and organizational level.

This research report will examine if and how serious games virtual work environments are used in practice for the development of social interaction skills , with a particular focus on people with Autism Spectrum Condition (ASC).

1. What are Social Interaction Skills?

Social interaction skills are defined as “socially acceptable learned behaviors that enable a person to interact with others in the ways that elicit positive responses and assist the person in avoiding negative responses” (Elliot, Racine & Busse, 1995, p.1009, as cited in Bellini, 2006, p.3).

Social interaction skills are critical to successful social, emotional, and cognitive development. They allow us to produce socially approved behavior in response to our peers. The lack of these skills may lead to social failure, peer rejection, but most important, these deficits are impediments to establishing meaningful social relationships, which can lead withdrawal and a life of social isolation. The social network of every person provides a foundation for later social relationships and career opportunities.

2. What are Serious Games?

Serious games try to connect playing with learning. They are games designed with a purpose to train social, intellectual or emotional skills rather than mere entertainment. Serious games have been used in education a long time, for instance in the military or in form of card or board games since the 1970s. The video game medium has unique qualities that make it different from other games. They are uniquely engaging because of their mixture of storytelling and game which cannot be found in other media. Games can support development of various skills: strategic thinking, planning, communication, collaboration, group decision making, and negotiating skills. (2)

3. What is Autism?

This question should be discussed in this report, as it is crucial for understanding the benefits of serious games and virtual work environments in the development of social interaction skills. Autism refers to a pervasive developmental disorder, characterized by severe impairment in social, communicative, cognitive, and behavioral functioning. Classic Autism is at one end of the autism spectrum. It is associated with absence of spoken language, delayed speech or even cognitive delay. Asperger syndrome is on the other end of the Spectrum, which does not involve these traits. Generally people with autism are struggling to make friends or to understand social rules. Prevalence number estimate 6 out of 1000 people for the autism spectrum disorder. (3)

4. Training of Social Interactions Skills with People with Autism

Traning of social skills with people of the autistic spectrum dates back to the 1970s. In a survey from 1974, Koegel and Rincover taught autistic children to function effectively in a group of autistic students. Initially, the students were only capable of working in an individualized instructional context. In another study, Strain, Kerr and Ragland (1979) showed that peers can be trained to induce autistic students to interact with them in a free play setting. Robert J. Gaylord-Ross, 1984 demonstrated, that social skill sequences with differing objects can be successfully taught to autistic children. To encourage social interaction with their peers these objects, which were given to them,

also appealed to non-autistic children. But it was necessary to train the students in such related social skills as greeting and positioning before they began to initiate and sustain interaction with their peers. Also the incorporation of a variety of persons lead to a considerable amount of generalized responding, even in a non-training context. (8)

5. Benefits of Serious Games Virtual Environments

There are a number of advantages, serious games virtual environments have over other types of learning.

The first benefit is the *simplicity* of virtual environments. For people on the autism spectrum, who often are overwhelmed by incoming stimuli and lack the means to distinguish between relevant and irrelevant information - and in particular for social interaction - those simplified virtual environments offer a controlled amount of input stimuli tolerable for the user.

Another important aspect of serious games and virtual realities is that they provide a *safe* learning environment. Because of the lack of consequences of their actions, users are able to experience different approaches to solve the problems of the game. Thus a virtual environment provides a less stressful and more forgiving environment for developing skills for social interaction.

Especially for autism, serious games can provide a platform to learn and understand the concept of *generalization*. With little modifications across similar scenes, the similarities can be made out more clearly for people with ASC, for which it is more difficult to recognize them. As implied earlier, the autism disorders vary significantly, so from one person to another, their strengths and weaknesses also vary. Because of this heterogeneity, an individualized approach is essential. Computer-based serious games allow this individual, dynamic learning process more than any other medium. (4)

6. Serious Games for the Training of Social Interaction Skills in Practice

Serious games that train social skills

6.1.Team-Up

In the game Team- Up children learn how to work together and make use of different skills different people posses. It is a puzzle solving game that involve different obstacles that can only be overcome by using different skills if three girls. The children ought to learn the importance of cooperation.

http://www.girlsinc.org/gc/page.php?id=6.2

A demo version can be found here:

http://www.youtube.com/watch?v=N_9vUVbmgnw&feature=related

6.2. Let's face it!

Although there are few examples of virtual work environments to teach social interaction skills, a number of computer learning programs and virtual realities have been developed to help teach people with autism different social and practical skills. Here are some of those examples: the Let's face it! program tries to use to computerized games to teach face recognition skills to children with autism spectrum disorder. This program combines seven interactive computer games that target the specific face impairments associated with autism, including the recognition of identity across image changes in expression, viewpoint and features, analytic and holistic face processing strategies and attention to information in the eye region. In a research by (Tanaka et.al 2010) it was shown that children who used these computer programs in the learning process showed reliable improvements of their face recognition skills. (5)

6.3.PDD-NOS

Another research team from the Netherlands developed a serious game with multi-touch interactions in order to teach children with PDD-NOS how to collaborate. PDD-NOS is a form of autism spectrum disorder. With this technology two children can work simultaneously on the same computer and screen. In the game the children have to solve mathematical problems on six levels. These problems are supposed to be solved together in order to teach them collaboration.

(6)

6.4.SMART

The SMART Games, developed by a Research team from the United States, is a video game intervention with the focus on improving empathy and related social skills of children with autism.

The design aims to modify behavior in sensory and motor skills, imitation and turn-taking, joint attention and theory of mind. The user plays the game by manipulating a “plush interface device” to affect the moods and behavior of an onscreen character whose appearance closely mimics that of the PID. The avatar has multiple moods that result through different actions with the PID.

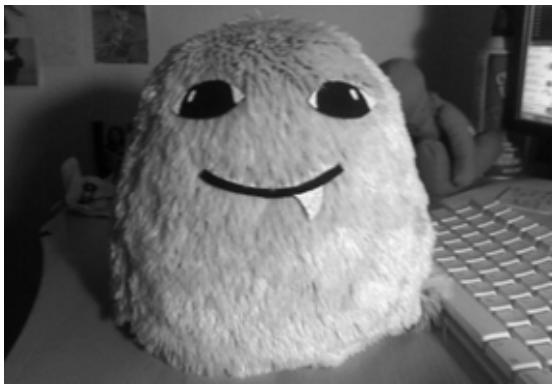
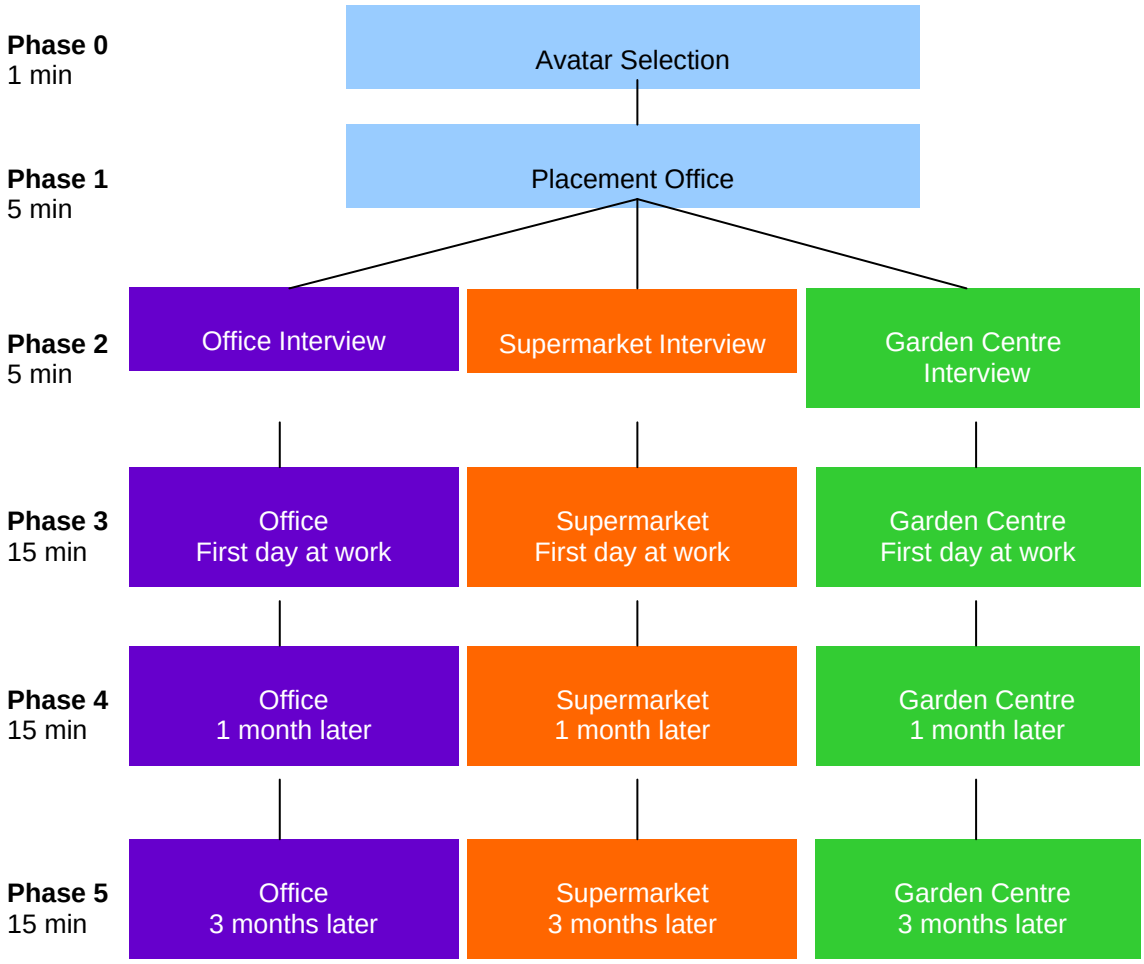


Figure 1. Plush Interface Device.
(7)

Figure 2. Onscreen Character.

7. Characteristics of the iSpectrum Serious Games

iSpectrum consists of three workplace scenarios: an office in the field of IT, a small supermarket, and a commercial garden centre.



Structure of the iSpectrum Serious Game

Each playthrough consists of six phases:

1. Avatar selection
2. A short interview at a work placement office
3. First day at work
4. About a month into work
5. About 3 months into work

In order to play through one of the scenarios, the player must first choose from one of four possible avatars, and then complete an initial phase which covers general employment skills. Some scenes from the game:

Avatar selection

Interview in the office: Boss (left) and Buddy (right)

Each phase in any workplace scenario includes both task-related and social tasks. The player will be assisted in coping with the challenges by the character of the "buddy". He gives the player both directions as well as constructive feedback to the selected responses. The game is designed in a way that tasks in the lower levels are simpler becoming increasingly more complex. Different conversational situations are practiced in the context of each work environment with different people such as the boss, colleagues, and customers. The conversational topics range from formal job- and task-related communications to small talks during breaks. Further more, Phase 5 includes tasks of perceiving facial expressions and the assignment of the appropriate emotional state that corresponds with the facial expression. In each situation, the player receives feedback about what would have been the most appropriate answer in each case or practice. In addition, the player has the option to have displayed a score reflecting their performance. Since the questions remain the same in every playthrough, players can try to increase their score up to an outstanding level.

8. Conclusions

The Serious Games Virtual Working environments implemented in the iSpectrum project were developed with the assistance of advisory groups. The design and functionality in the game is based on the recommendations of psychologists, autism professionals, employers and people on the autistic spectrum. In the course of the project, further research will follow on usage, usefulness and effectiveness of the developed serious game.

Appendix: References

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