

Social Skills Training Tool in Virtual Reality, Intended for Managers and Sales Representatives

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ABSTRACT

Social skills training courses for managers and sales representatives are mainly realized today through role-playing sessions, which show several limits: realism, contextualization, evaluation objectivity. This paper describes a prototype of a Virtual Reality tool intended to answer these issues. This tool allows living role-playing sessions with virtual characters. We present the results of the first user tests we carried out. Users felt spatially present, involved, and socially present. Results also underline areas of improvement, such as non-verbal behaviors, scenario content and environment realism.

1 INTRODUCTION

Wiemann [13] defined social skills as *the ability of an interactant to choose among available communicative behaviors in order that he may accomplish his own interpersonal goals during an encounter while maintaining the face and line of his fellow interactants within the constraints of the situation*. These skills are widely used in many professions such as managerial and commercial professions.

Today, managers and sales representatives training cycles include role-playing sessions with an instructor. Besides their human and financial costs [10], these training sessions tend to show some limits [7]. They lack realism, authenticity, and pragmatism [5]. Because peers or instructors play the roles, attitudes and conversations tend to impact roleplay's realism and authenticity. Furthermore, when the actors are not the same between two learning groups, there could be differences in the way they play the role [6]. Learners also expect to be pushed to a difficult position by the trainer, and spectators presence could potentially affect learners' behavior. Furthermore, it is often difficult to offer learners a wide variety of situations and person profiles [10]. Training sessions are not always made in a real context. Scenario fidelity could suffer from the environment in which the roleplay takes place. When practicing in a classroom, learners will not feel the place atmosphere and its specificities, which could impact their perception: sounds disturbing the communication, spatial position in front of interlocutors.

These gaps could strongly limit the emotional dimension of the roleplay, which is an important angle of social skills development. Learners will accumulate experience on emotions felt during the learning session and on the thinking process which follows. These limits do not guarantee that skills acquired during training will be applied correctly in real situations.

We propose a VR tool as a solution to identified limitations. Virtual Reality allows living virtual experiences, which can answer to realism and contextualization lack. This paper is organized as follows. On the next section, we will introduce related work. Afterward, we will present the VR prototype we implemented, and then



Figure 1: Scenarios: managers (left) and sales representatives (right) the user tests we carried out. We will finish by analyzing results and underlying the directions of our future works.

2 RELATED WORK

Many works studied interaction with virtual characters for social skills training by role-playing in Virtual Reality [5–7, 10]. Virtual characters tend to induce a social presence for learners [7], which favors learning [8]. Nevertheless, the use of these conversational animated agents can cause some problems. Their design remains a complex task requiring significant works in voice recognition and artificial intelligence. That is why some systems [2] opt for a "Wizard of Oz" approach to overcome potential problems. This approach gives the control of the virtual character to an operator. He can manipulate a character remotely, and trigger his verbal and non-verbal actions. Finally, this approach brings various important methodological contributions. It favors exploration of conception trails for a future automated system, as well as hypotheses on the way which users and virtual characters will interact [3].

Studies noticed effects of gender during human-machine interactions [9]. Thereby, some works deliberately confronted test subjects with a character of the same gender, to limit variability effects [3].

Finally, other works were interested in head-mounted displays (HMD) uses in Virtual Reality for human-virtual characters interaction [4, 10]. Nevertheless, we found no works in the literature about uses of virtual characters in Virtual Reality for social skills training addressed to managerial and commercial professions.

3 PROTOTYPE

We realized a prototype to assess contributions of Virtual Reality for managerial and commercial training, and thereby confirm its interest. The prototype implement Wizard of Oz, composed of two elements: a Virtual Reality application for the learner, and a control panel for the trainer.

3.1 Virtual Reality Application

After being equipped with an HTC Vive HMD, learners are immersed in a Virtual Reality introduction scene, in which they will get familiar with the technology. Then, when the instructor starts a training scenario, learners found themselves in a new scene in which they can interact with virtual characters.

3.2 Instructor's Control Panel

The control panel allows instructors to select a scenario. When the scene starts, they have an interface following the Wizard of Oz approach. It allows controlling different agents to modify their face emotions and to make them talking or moving.

The prototype implements two scenarios defined by instructors. For managers, learners find themselves in a production area and have to announce a painful decision to a team (Fig. 1, left). Learners are driving the communication and must adapt their answers to various reactions of the team. Instructors will customize virtual characters behaviors according to learners' profile, experience, and

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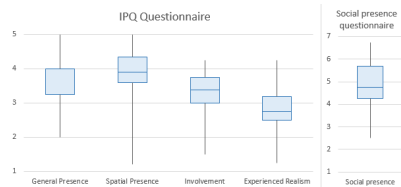


Figure 2: IPQ (left) and social presence (right) results.

performances. For sales representatives, learners find themselves in a negotiation situation, inside a meeting room, where two virtual characters are playing customer's representatives (Fig. 1, right). They are going to face customers' discontentment and must show attentiveness and understanding. They must make proposals which will satisfy customers. They have to maintain the customer relation link and avoid a rupture situation, by answering to the customers' satisfaction without being contradictory with their company objectives.

4 USER TESTS

We carried out user tests on the VR prototype to see how users felt social interaction with virtual characters, and if they also felt present in the virtual environment.

4.1 Tests Proceedings

Managers and sales representatives scenarios are highly specific to these professions, so we choose to carry out user tests on a common and easily understandable scenario. We used the sales representatives' simulation scene (Fig. 1, right). Taking inspiration from the literature [11], we adapted it to a restaurant-choice negotiation scenario with a single virtual character. Female users faced a feminine character and male users a masculine one. We tested the prototype on 54 Capgemini co-workers. Users were composed of 63% men and 37% women, and their average age was $36(\pm 10)$ years old.

At the end of the negotiation in Virtual Reality, users had to answer a presence questionnaire (IPQ) [12] and a social presence questionnaire [1]. Finally, they were encouraged to express feedback about their experience, during an open interview.

4.2 Results

4.2.1 IPQ questionnaire

Results from the IPQ questionnaire (Fig. 2) appear satisfying, excepted for Experienced Realism. When we analyzed questionnaires answers, we noticed that the virtual world realism was sparsely rated ("How real did the virtual world seem to you?": $2.91(\pm 0.90)$, "The virtual world seemed more realistic than the real world.": $1.56(\pm 0.82)$). The simplistic style of the environment rendering could explain these results. Interviews tend to confirm this hypothesis. Some users underlined the oversimple rendering of the environment. The aim was to avoid as far as possible learners being more focused on the environment than on social interaction with virtual characters. We should carry out additional studies in order to see if improving Experienced Realism could impact learners attention to social interactions negatively.

4.2.2 Social presence

Results from the social presence questionnaire (Fig. 2) also appear satisfying. Interviews let underline areas for improvement which could have impacted the social presence negatively. Users expressed requirements on non-verbal behaviors. Criticisms concerned gestural animations during the speaking (24%) and gaze use (11%). At this stage of work, when the character speaks, a gestural animation is randomly played. It will be important to improve this system to make gestures linked to words pronounced by the character. Concerning gaze, characters were not following the user and could sometimes randomly look away. Again, we consider improving this behavior.

We did not inform users that we were remotely controlling virtual characters. Interviews revealed an impact less important than expected. If 24% of users underlined they felt the Wizard of Oz by the reaction time, on the other hand, 15% of them expressed that their virtual interlocutor seemed understanding them.

4.3 Results Limits

Some elements could have impacted these results. User tests took place inside an open space of the company, which could have impacted the sense of presence negatively. Furthermore, users were mostly composed of software engineers. A large part of them (56%) already have been aware of our work, whether through discussions (52%), a presentation video (13%) or for having tried the prototype during development steps (7%). We plan additional studies on end-users to verify our results.

5 CONCLUSIONS

In this paper we presented work in progress on a VR social skills training tool, intended for managers and sales representatives. We carried out user tests on a basic scenario to assess a first prototype. Results appear satisfying. Users felt spatially present, involved and socially present. They also underlined areas of improvement, such as non-verbal behaviors, scenario content, and environment realism.

We will now experiment the prototype on managers and sales representatives. It will be a matter of analyzing the usability of the tool on professional scenarios, then assess learning and motivation contributions, as well as mistakes awareness and self-confidence for learners. The added value of the HMD should also be analyzed.

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