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# Let Us Converse Virtually! Conversation Skills Training through Virtual Reality

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## Background

People with autism spectrum disorder (ASD) typically have difficulties with communication and socialization skills, (Fombonne, 2005; Levy & Perry, 2011; Rivet & Matson, 2011; Suzuki 2011). Such difficulties are linked to the development of problem behaviours, and thus young adults with ASD struggle to find or keep employment; to begin or maintain a relationship; to become part of a community, Assistive technology aims improving their quality of life by helping them attain employment and independent living.



## Virtual Reality Affordances

Studies have shown that a Virtual World can:

- stimulate users' interactivity (Roussou, 2004) and motivation (Garris et al., 2002; Ott & Tavella, 2009)
- make conversations easy, structured and inclusive (Newbutt, 2013)
- offer users a sense of co-presence and realism (Childs, 2010; Yee et al., 2009)
- provide an increased sense of control (de Freitas et al., 2010)
- improve users' knowledge, enjoyment and interest in learning (Papastergiou, 2009).

## Virtual Learning for people with ASD (VL4ASD) project

### Virtual World (VW) development: early stages

- The VW development was an iterative process and employed a Participatory Design approach:
- 2 developers with experience and expertise in autism, created a minimally viable version of the VW.
  - software test sessions with two 15-user stress test groups (8 of whom were people with ASD), which identified anomalies or features that were difficult to use.
  - revised version of VW was created that showed significant performance improvements (Politis et al., 2017)

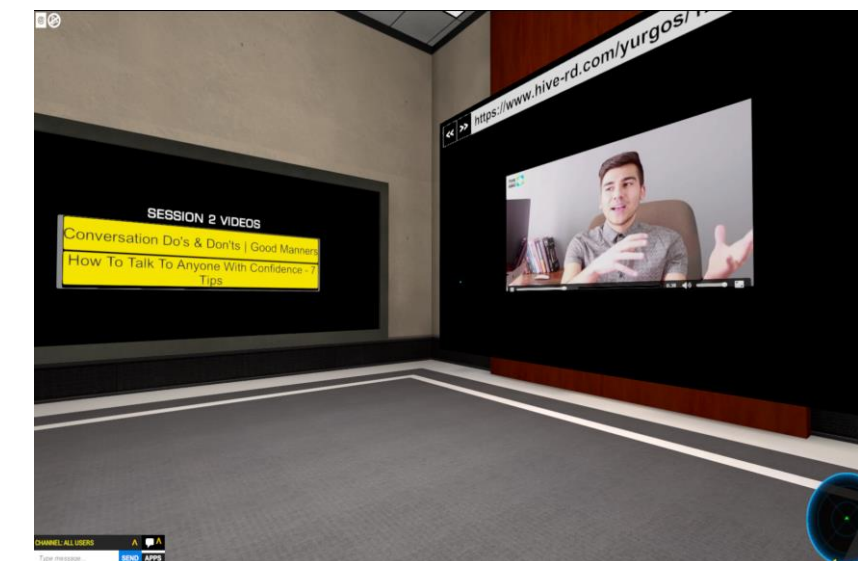
### The Training material

The training consists of 6 sessions in the Virtual World (VW) and covers the following categories:



- What is conversation and how does it work?
- Why is conversation useful? & Approaching someone to have a conversation
- Starting a conversation & Why are topics appropriate and inappropriate?
- Finding common interests
- Taking turns & Answering questions
- Switching topics & Ending a conversation

References  
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Each session has:

- PowerPoint presentation (photos, images, sketches), and a short quiz at the end.
  - 2-3 YouTube videos (role-playing examples or real-life examples of the elements of conversation mentioned in the presentations).
  - a non-playable character who is narrating the text of the PowerPoint presentations (participants can read and listen to the material).
- We also explored introducing a 'chatbot' (non-playable character), as an additional training element.

### VW development: User feedback of training material

This testing phase included a feedback session with 6 people with ASD, and another with 2 practitioners.

**PROS:** Participants felt that VR has potential in providing training for neurodiverse populations; they thought delivering training in three formats (PowerPoint, videos, chatbot) could contribute to the learning

**CONS:** Participants commented on the visual presentation, pacing and organisation of the content. They felt that in its current stage of development the chatbot was not interactive enough. They focused more on design elements, rather than the educational content (Politis et al., 2017)

### Intervention:

**Study Design:** Multiple Baseline Design

**Sample:** 3 participants on the mild/moderate end of the autism spectrum (one had co-morbid Anxiety, depression & ADHD); early 20s (2 male -1 female); all three were students (one also has a full-time job); one was receiving another treatment at that time.

**Procedure:** 4 Phases; 15-16 sessions in total over 9-week period

**Duration:** 10-30 minutes each session

PHASE 1	PHASE 2	PHASE 3	PHASE 4
Having a conversation in a ...	Training - then a conversation in the ...		Having a conversation in a ...
Physical Space	Virtual Space	Virtual Space	Physical Space

Semi-scripted conversations in Phases 1-3 (each session had a specific topic & there were 5 questions). The topics for Phase 1 were related to school life; in Phases 2 and 3 the topics covered TV, films, music, travel, animals, computers etc.

DATE	25-Sep	2 oct	09-Oct	16-Oct	23 Oct	30-Oct	06-Nov	13-Nov	20-Nov
P1	RW	VW	Training +VW	Training +VW	RW	RW	RW		
No Sessions	4	3	3	3	1	1	1	1	
P2	RW	RW	VW	Training +VW	Training +VW	RW	RW	RW	
No Sessions	1	3	3	3	3	2	1	1	
P3	RW	RW	RW	RW	RW	VW	Training +VW	Training +VW	RW
No Sessions	1	1	1	1	1	3	3	3	3

### Assessment:

Perceived Empathic Self-Efficacy Scale (PESE); Perceived Social Self-Efficacy Scale (PSSE); Generalized Anxiety Disorder Scale (GAD)

	PESE		PSSE		GAD	
	PRE	POST	PRE	POST	PRE	POST
Participant 1	15	18	14	22	3	2
Participant 2	20	18	24	24	0	0
Participant 3	18	19	17	16	13	9

We have also adapted the Conversation Skills Rating Scale (CSRS), which is currently under review and validation.