

Using Virtual Role-Play to Prepare for Cross-Cultural Communication

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ABSTRACT

Effective cross-cultural communication requires more than knowledge of cultural facts, or of what “dos and don’ts” apply. It requires the ability to interact smoothly, effortlessly, and with confidence. Virtual role-play has proven to be surprisingly effective at promoting effective cross-cultural communication. In virtual role-play learners can practice simulated cross-cultural encounters in virtual worlds, interacting with artificially intelligent virtual role-players that behave and respond to the learners in a culturally accurate manner. Learners develop and practice their cross-cultural skills in a safe environment, without fear of embarrassment. When learners then engage in a real cross-cultural encounter it feels familiar to them, which instils confidence. At Alelo we have extensive experience in implementing the virtual role-play approach and applying it to cross-cultural communication. Noteworthy examples include the VCAT cultural awareness trainers that are in widespread use for preparing US military personnel for overseas deployments, and the goEnglish website developed for Voice of America that has introduced people around the world to American colloquial English and American culture. We have developed a plug-in called VRP MIL for VBS3, so that trainers can populate training scenarios with virtual role players. This can make cross-cultural skills an integral part of any virtual training scenario.

Keywords: Cross-Cultural Communication, Cross-Cultural Training, Cross-Cultural Competence

INTRODUCTION

In today’s interconnected world it is increasingly important for people to be able to work effectively in multicultural contexts. Whether in their home country or on overseas assignments, people need to be able to work effectively with people with diverse cultural backgrounds. In the military this is true both for leaders (Abbe, Gulick, & Herman, 2008) and for general-purpose forces (Hardison et al., 2009; Caligiuri et al., 2011). Cross-cultural skills are important for expatriates (Young, 2011) and for business people conducting business overseas, e.g., for cross-cultural sales negotiations (Simintiras & Thomas, 1997). They are also critical for service industries that support diverse populations such as hospitality (Gannon, 2008) and healthcare (Saha et al., 2008).

In considering how to train and assess cross-cultural competence, Caligiuri et al. (2011) distinguish *cultural learning* from *cultural agility*. Cultural learning enables people to quickly gain an understanding of the socio-cultural context of an activity. Cultural agility provides the ability to respond effectively in situations of cultural diversity. In cross-cultural interactions cultural learning is helpful, but cultural agility is the key to success.

Unfortunately it can be hard for learners to get sufficient access to high-quality learning experiences that promote cultural agility. Caligiuri (2011) recommends giving learners safe international immersion opportunities, e.g., opportunities to study abroad, prior to deployment. That is certainly beneficial, but it is unlikely to be a practical option for working adults. Working adults require training solutions that are convenient and do not require being away from work for extended periods.

Gudykunst et al. (1977) recommend intercultural communication workshops, in which learners engage in interactions with host nationals, as well as role-playing exercises in simulated host-culture environments. Live role-play exercises have also been used extensively to prepare military personnel for deployments to Iraq and Afghanistan (Miles, 2010). Such training is effective when available but can be costly and inconvenient, especially when it involves multiple human role players and travel to remote training sites. Because of cost considerations military organizations around the world are considering reducing their reliance on live role-play exercises.

Virtual Role-Play is a powerful but low-cost alternative to live role-play training. In Virtual Role-Play, learners develop and practice their cross-cultural skills in simulated cross-cultural encounters with artificially intelligent virtual role-players. It enables learners to practice their skills in a safe environment; they can make cultural mistakes and practice recovering from those mistakes, without fear of embarrassment or negative consequences. Virtual Role-Play can serve as a complement to live role-play training, and can be made available to learners anywhere and anytime.

Alelo has extensive experience developing and delivering training featuring Virtual Role-Play exercises on a variety of computing platforms, including desktop computers and mobile devices. These exercises cover all aspects of cross-cultural interpersonal communication, including conversation in foreign languages, nonverbal communication, and cultural norms of behavior. Alelo has developed a plug-in called VRP[®] MIL for the popular VBS[®] virtual training environment, which make it possible to integrate cross-cultural training with other types of virtual training. This makes cross-cultural training an integral part of occupational training, as opposed to a separate and possibly marginalized learning activity.

The remainder of the paper is organized as follows. First, the paper presents some examples of Virtual Role-Play simulations, which illustrate the power of the approach. It then describes Alelo's methodology for developing and delivering high-quality, culturally accurate Virtual Role-Play simulations. The paper then introduces the VRP[®] MIL plug-in and describes how it is used. Evaluation results are presented which attest to the power and effectiveness of the approach. The paper then concludes with a discussion of future directions for the work.

EXAMPLE VIRTUAL ROLE-PLAY EXERCISES

Preparing for a Chinese Banquet

Imagine you are a foreign affairs officer who has just arrived on assignment in Taiwan or China. Being new in the country it is important that you establish good relations with your host-country counterparts. Your introductory meetings go well, and your counterparts invite you to join them for a banquet. This is a great opportunity, but also a challenge. You understand that there are protocols associated with such events. Your hosts may offer toasts, and you will be expected to offer toasts in return. Much alcohol may be consumed. Your hosts might even decide to take advantage of the situation, to see if you can hold your liquor. How do you show proper respect for your hosts and develop good relations with them, without getting drunk in the process?

This is problem of etiquette, as well as a problem of cross-cultural communication. To succeed you must understand the cultural norms for such situations, and know what to say so that you can navigate the situation and accomplish your objectives. It is also a problem of cultural agility. The more aware you are of how your hosts behaving and responding to you, the more likely you are to succeed. It will also help if you can approach the situation with confidence. It is natural to be ill at ease in unfamiliar situations such as this, but if you appear ill at ease your counterparts may sense that and react negatively to it.

Situations such as this, and the cross-cultural communication problems that they pose, are ideally suited for Virtual Role-Play training. Figure 1 shows some screenshots from one of the banquet scenarios in the VCAT (Virtual Cultural Awareness Trainer) course for Taiwan, developed for Joint Knowledge Online. The learner's avatar, on the right, offers a toast, saying "drink as you like." The host on the left, a virtual role-player, responds by picking up a shot glass and saying "Ganbei". The player's avatar then follows by picking up his teacup. Through this rapid sequence of utterances and nonverbal gesture the player handles the situation smoothly, strengthens his relationship with his host, while staying within the bounds of cultural norms.

Once learners have practiced in these Virtual Role-Play simulations and have fully mastered them, they can approach the corresponding real-world situation (e.g., Figure 2) with greater confidence. Learners who experience such encounters for the first time after having undergone Virtual Role-Play training often report that the situation

feels familiar to them, even though they have only experienced it in simulation. They know and what to expect, and so are able to handle the situation with greater confidence.



Figure 1. Screenshots from a banquet training scenario, from VCAT Taiwan



Figure 2. An actual business banquet

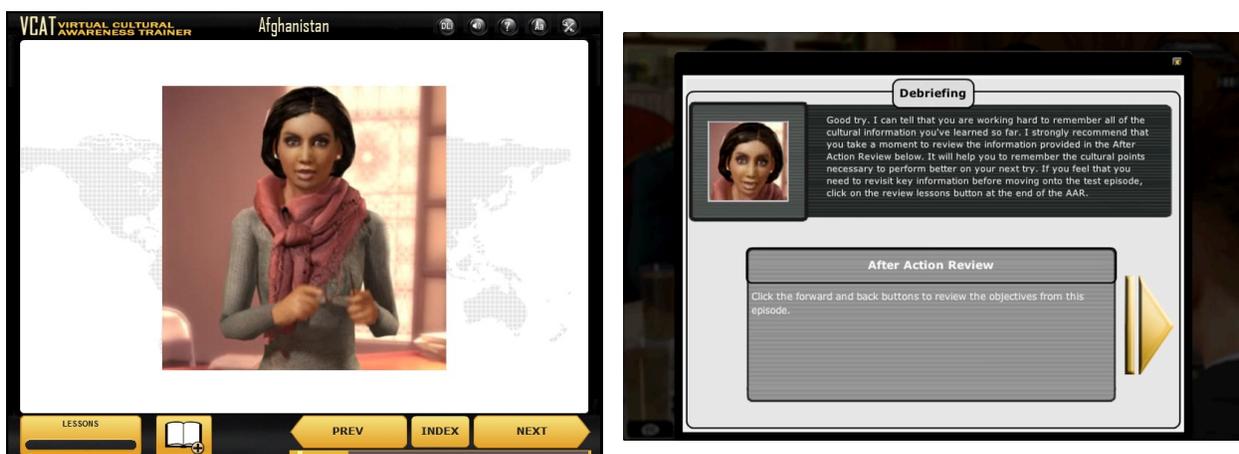


Figure 3. The VCAT Virtual Coach

Alelo cultural awareness courses typically include a combination of practice scenarios, in which they develop their communication skills, and test scenarios, which are used for assessment. Virtual Role-Play is an excellent approach to assessment because it requires learners to demonstrate their skill and agility in applying their cultural knowledge

in realistic situations. To help learners develop that knowledge and skill, we provide them with a variety of other multimedia learning materials, as well as scaffolding (i.e., help) within the practice scenarios. This scaffolding is provided by a Virtual Coach (Figure 3) that guides the learner through the scenario. The Virtual Coach introduces the exercise, helps the learner prepare for it, monitors the learner as he or she goes through it, and then provides a debrief afterwards.

Other Example Virtual Role-Play Training Systems

VCAT courses (Johnson et al., 2011) have become a standard method for delivering cultural awareness training to US military forces. Most of the US combatant commands use them, in preparation for deployments to Asia, Africa, Central and South America. Over 50 countries are covered so far by VCAT courses. Military users like them because the training that they provide is engaging, is accessible on line, and provides lasting results in a short amount of time. Learners complete a typical VCAT course in only two to four hours. Versions are available both for desktop use and on mobile devices.

Alelo has applied the Virtual Role-Play approach to a variety of other training programs. Figure 4 shows two examples. On the left is an example from goEnglish, a Web-based course developed for Voice of America to give people around the world an opportunity to learn American colloquial English and learn about American culture. People learn through simulated encounters in a range of everyday situations. In this example the learner learns about cultural norms regarding shopping in American stores, e.g., what to do if you cannot find an item of clothing in your size, or whether or not to haggle over prices is expected. Versions of goEnglish have been developed for speakers of multiple languages around the world, including Chinese, Farsi, Indonesian, Vietnamese, and Russian.

Figure 4 right shows an example from the TI Simulator (Tactical Interaction Simulator) developed for the Australian Defence Force. Trainees practice their communication skills in a variety of simulated overseas missions. Simulated missions are provided at multiple levels of difficulty: Red (host nationals are hostile), Green (host nationals are cooperative), or Amber (host nationals can become cooperative or hostile depending upon the learner's actions). Game play and scoring is designed to encourage trainees to practice missions multiple times, at increasing levels of difficulty, until they have fully mastered the necessary communication skills.

Many Alelo training courses, including TI Simulator and goEnglish, incorporate spoken language technology, developed specially by Alelo to meet the needs of language learners (Sagae et al., 2011). Learners speak on behalf of their avatar, and the virtual role-players respond as appropriate for the situation. The choice of language depends upon the training application. In goEnglish the language is English; in VCAT Afghanistan the language is Pashto or Dari; in the TI Simulator – Tetum the language is Tetum, the national language of East Timor. Each virtual role-player is equipped with a dialog model that enables it to respond to a variety of learner utterances on a variety of topics appropriate to the situation. The range of topics changes dynamically over the course of the interaction, depending upon what the learner says and does. The resulting learner experience is one of unscripted conversation, not following a memorized script.



Figure 4. Other example Virtual Role-Play simulations: goEnglish (left), TI Simulator (right).

DEVELOPMENT METHODOLOGY AND INSTRUCTIONAL APPROACH

The starting point for creating effective Virtual Role-Play simulations is research to identify the specific communication skills involved in the tasks that the learners are training for (Johnson et al., 2012). This work draws on best practices in sociocultural and linguistic anthropology (Hymes 1974, 1987; Hall 1966; Birdwhistell, 1970) to develop data about interpersonal interaction that is accurate, relevant, and suitable to serve as a basis for creating Virtual Role-Play exercises and other learning materials.

Ethnographic interviews with subject matter experts (SMEs) provide information about the jobs, missions, and tasks that the trainees will be training for (Bernard, 2000). These interviews provide information about the contexts in which tasks occur, what sorts of interactions take place in the course of carrying out those tasks, and how social and cultural dynamics can influence how tasks are performed in different settings. We interview SMEs in depth to gather specific examples of spoken dialog that occur in these work settings. We engage SMEs in role playing as a way to prompt them for more examples of communication in practice. This yields examples of verbal communication as well as examples of nonverbal communication. Both of these are important for creating Virtual Role-Play exercises that are realistic as well as instructionally effective. Nonverbal cues are particularly important because people are often not aware of them, yet they provide useful signals as to how someone is interpreting and reacting to what someone is saying.

We are particularly interested in first-person narratives of specific experiences they had. They provide concrete examples of interactions, which we can use as the basis for creating role-playing scenarios. We videotape these narratives, for future reference and to integrate into the training materials that we create. We find that such first-person accounts, when given by experienced, seasoned professionals, give added credibility to the learning materials.

We supplement the data from the ethnographic interviews with background research from published sources, e.g., the Central Intelligence Agency's World Factbook and the Human Relations Area Files (HRAF, 2014). The ethnographic interviews help us to focus in on the specific cultural issues that warrant further investigation, which is important since these resources tend to be very broad in scope.

Throughout this process we cross-validate information that we gather. We make sure that cultural information is corroborated by multiple sources. This is critical for establishing the credibility of our learning materials, and it is particularly important for cross-cultural training. Our learners typically are not cultural experts themselves, and so they want to be able to trust the accuracy and reliability of the training that they are getting.

The sociocultural research then provides the basis for instructional design and authoring. Our instructional design methods draw on best practices, with an experiential emphasis. Role-play exercises and role-play-related activities can play multiple roles within a complete course. Some serve as *exploratory simulations*, in which learners try out a role-play exercise before they have learned the necessary skills. This helps them become acquainted with the skills they must learn and the context in which they must apply them. *Mini-dialog exercises* give learners opportunities to practice and master the individual conversational turns that occur during a longer dialog. *Practice simulations* give learners opportunities develop their skills and achieve mastery. *Test simulations* are used to test whether the learner has mastered the necessary skills and is able to apply them successfully. These differ primarily in the amount of assistance the learners receive, e.g., from the Virtual Coach shown in Figure 3. Learners may require a lot of help to get through an exploratory simulation, while in a test simulation they do not receive any assistance.

Depending upon the particular course, role-play exercises may be combined with other types of learning materials. These include the first-person narrative videos mentioned above, as well as instructional materials that introduce cultural concepts and vocabulary, as well as casual games that reinforce individual concepts.

INTEGRATED VIRTUAL ROLE-PLAY TRAINING

Although the Virtual Role-Play approach is well suited to training communication skills, it does not train communication skills in isolation. As noted in the previous section, it trains communication in the context of performing tasks, jobs, and missions. It thus naturally fits with as a component of training for those tasks, jobs, and missions. An example of this integrated approach is the new VRP[®] MIL plug-in for VBS[®]3.

VBS[®]3, by Bohemia Interactive Simulations, is an immersive virtual training environment in which teams of trainees can practice military operations. In addition to live players, VBS[®]3 simulations are populated with simulated combatants and civilians, which have limited intelligence and limited ability to interact with trainees. VRP[®] MIL makes it possible for trainees to communicate with the non-player characters using spoken language. This results in a more realistic training experience, in which effective cross-cultural communication skills are a prerequisite for mission success.



Figure 5. A VRP[®] MIL training scenario

Figure 5 illustrates how the user interacts with a VRP[®] MIL-equipped desktop simulation of an Afghan village. Trainees can approach non-player characters and start conversations with them. In this example the trainee is engaged in conversation with the leader of the village. When the conversation starts VRP[®] MIL activates its speech recognizer and listens for the trainee to say something in its language – in this case Pashto. It then responds accordingly, using speech and gesture. Its responses depend upon its attitude toward the trainee, which in turn depends upon what the trainee says and does. On the left the trainee has greeted the village elder who returns his greeting. On the right the trainee has succeeded in establishing rapport and trust with the village elder, who welcomes him into the village.



Figure 6. Interaction with a VRP[®] MIL character in a mixed-reality environment

VRP[®] MIL can also be used in mixed-reality training environments, as illustrated in Figure 6. Here the trainee has approached a virtual role-player that is projected onto the wall. A bank of microphones is located at the top of the wall, enabling the VRP to listen to trainees who enter the room. This makes it possible for trainees to engage in natural conversation with the virtual role-players. Trainees find that mode of interaction very natural, and preferable to sitting in front of a computer.

VRP[®] MIL uses Alelo's VRoleplay[™] runtime engine to control the behavior of the virtual role-players. Figure 6 illustrates how the VRoleplay[™] engine operates in the context of VBS[®]. Different versions of VRoleplay[™] are also used to control the other virtual role-players in this article. The version for VRP[®] MIL is one of the most complex because VBS[®] is itself a complex training environment, in which multiple trainees can operate simultaneously.

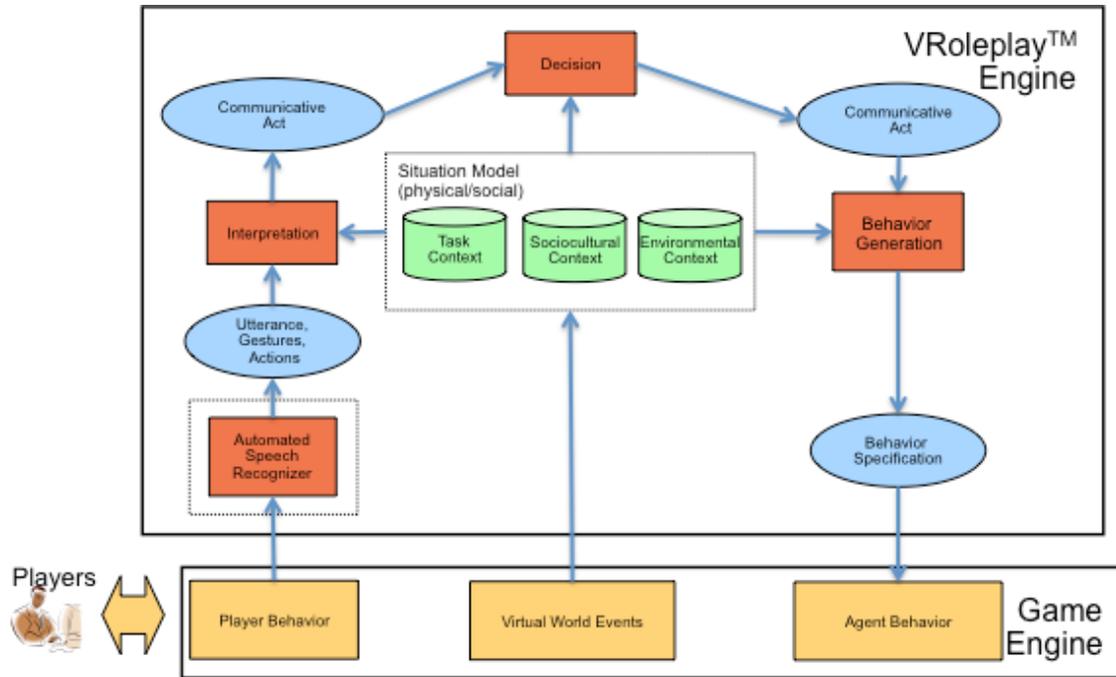


Figure 6. VRoleplay[™] Engine Architecture

When a trainee approaches a virtual role-player and starts a conversation, the VRoleplay[™] engine activates the dialog model for that virtual role-player and starts monitoring the trainee's behavior – speech as well as actions selected through the user interface. It then interprets the communicative intent (i.e., the meaning) of the trainee's actions, in the context of the culture and the situation. The trainee's actions are thus interpreted as a sequence of meaningful communicative acts. The virtual role-player then decides what communicative acts it should perform in response. For example, if the trainee's utterance ("Salaam aaleykum") is interpreted as a polite greeting, the village elder will decide to respond politely to the greeting. The virtual role-player's decision depends in part on its attitude toward the player, which in turn depends upon the trainee's previous actions. The virtual role-player then generates behavior to perform the action as a combination of speech and gesture, as shown in Figure 5 left. The game engine then plays the chosen speech recordings and gesture animations.

In a typical use case we provide training officers with a library of virtual role-players, each designed to perform a specific role in a specific task or mission. This makes it possible for training officers to construct their own training simulations.

RESULTS AND EVIDENCE OF EFFECTIVENESS

The effectiveness of the Alelo Virtual Role-Play approach first became apparent with Marines deploying to Iraq (cite. The Third Battalion, 7th Marines (3/7 Marines) assigned two Marines in each squad to train forty hours using the Tactical Iraqi[™] game. The 3/7 Marines completed their tour of duty in Iraq without a single combat fatality – a first for a Marine battalion in Iraq. The Marine Corps Center for Lessons Learned conducted a study with the battalion to identify reasons for their success (MCCLL, 2008). They interviewed the officers and surveyed the Marines. They documented a number of instances where the ability of the Marines to engage effectively in cross-cultural communication with the Iraqis helped establish rapport and contribute to mission success.

A study was recently conducted with trainees of VCAT trainees deploying to Afghanistan and South America. A total of 102 subjects participated. The study was designed to collect evidence of training effect at each of

Kirkpatrick's four levels of training evaluation (Kirkpatrick, 2006). The trainees completed a four-hour VCAT course, and then completed a 5-point Likert-scale survey to assess their reactions to the course and how much they learned from it. We followed up two months later with another survey, both of the trainees and the trainees' supervisors. By this time many of these trainees had been deployed overseas, making it possible for the trainees and their supervisors to assess the impact of the VCAT training on the trainees' cross-cultural skills in country. The study confirmed that the trainees had a positive reaction toward the course (4.1 out of a possible 5) and learned from the course (3.9 out of a possible 5). 21 subjects completed the follow-on survey, and indicated that the VCAT training had a lasting positive effect on their behavior (3.5 out of 5). By this time half of the trainees had been deployed overseas, and the ones who deployed overseas reported a greater benefit from VCAT training (3.9 out of 5). Nine supervisors participated in the study, and their impressions were also positive (3.5 out of 5). Considering that the study took place months after a four-hour training course, the results are encouraging.

CONCLUSIONS AND FUTURE DIRECTIONS

This article has provided an introduction to the Virtual Role-Play approach to training cross-cultural communication skills, in a variety of example training environments. The approach has proven to be very effective, able to train critical communication skills in a very short amount of time.

We are now adapting the approach to address key problems in soft skills training for business. We are currently developing a course in business communication for Otsuka Pharmaceuticals. The course addresses the skills necessary for effective communication in a business setting, such as interpreting body language. We are finding that many of the same skills that are required for effective cross-cultural communication also apply in a business setting. The Virtual Role-Play approach applies very well to these training problems. We are extending the approach to offer training to sales professionals and others who require effective interpersonal communication skills.

We are also conducting an experiment with lifelike robots as virtual role-players, with support from the National Science Foundation. In collaboration with Robokind, a developer of lifelike robots, are taking a lifelike robot and are equipping it with the ability to converse in Chinese. We plan to try it out in high schools. Our expectation is that learners will find it to be a more natural way of practicing conversation than typical on-line language learning software. It will thus be an easy way for learners to become acquainted with a difficult language such as Chinese.

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