

First Impressions - A Visual Novel for enhancing cross-cultural understanding

CSC 499 - Fall 2017

Louis Jacobowitz
Student

Chris Martens
Mentor

Abstract—As part of a collaboration with NCSU's Global Technological Initiative, we created an interactive conversation module to model conversation between participants of different cultural backgrounds. The goal of the project was to create a module that was effective in educating a student in cross-cultural interactions by letting them experience the effects of certain outcomes. The module we created was adapted from the RenPy engine, and used a script adapted from the GTI's materials. At the end of the semester, we successfully implemented a prototype and designed an IRB-approved experiment for evaluation.

I. INTRODUCTION

Cross-cultural interaction is increasingly necessary in this increasingly global world. Often, international business teams, consisting of members of different nationalities from companies in different countries, are formed as collaborations towards greater goals by each company. However, cultural differences can interfere with effective communication and teamwork in such nonhomogeneous groups, when differences exist in members' cultural orientations.

Organizations such as NCSU's Global Training Initiative (GTI) have made it a mission to help provide cross-cultural business training and professional development to inspire young entrepreneurs. Such efforts mainly take the form of questionnaires and courses. Newer technologies include virtual reality recordings of meetings that display cross-cultural difficulties in relevant business situations, allowing the user to take the role of any conversation participant and become privy to that participant's thoughts. Though this approach is a significant advancement, it is a passive experience, and a better method of education would be in actively making the decisions on what to say and how to respond in cultural situations.

Our goal was to create an interactive simulation where the player can change the course of the conversation by choosing what to say, and when to speak up in the conversation. This allows the player

some agency in the conversation, allowing them to learn by doing rather than simply by seeing.

II. LITERATURE SUMMARY

The driving force behind creating a more interactive module is the widely-accepted notion that learning by doing is more effective than learning by seeing. Research focused on the effectiveness of cross-cultural training has isolated five phases in an effective and simple cross-cultural training routine[2]. Phase 1 involves introducing relevant cultural concepts; phase 2 includes the examination of a participant's own cultural background and practice in reconciling differences with one other conversant; phase 3 focuses on small group interaction. Phase 4, preceding a debriefing in phase 5, "is devoted to a cross-cultural simulation" (16), which is what we attempt to emulate here.

Our approach to quantifying cultural differences is rooted in some research performed by the Training Management Corporation[3]. Specifically, this research isolated 17 "cultural orientations", or culturally-conditioned patterns of behavior. Each is its own dimension, with opposite ends of the scale representing opposite approaches to certain situations – for example, the View of Time orientation runs from Fluid to Fixed. Discrepancies between the cultural orientations of conversational participants can cause friction, such as if an individual with a fixed view of time interacts with someone who has a fluid view of time, expecting a task to be handled promptly.

III. METHODOLOGY

The first several weeks of the project involved brainstorming and experimenting with the technologies we would use to create the simulation. We met monthly with representatives from the Global Technological Initiative to inform our approach to designing the simulation, and to learn how to apply cultural orientations to the flow of the conversation. In particular, we decided to aggregate

the 17 cultural orientations to a simple 4: Communication Style, View of Time, Relationship/Task orientation, and Hierarchy/Equality orientation. We also decided to use a Visual Novel as the medium for our conversation, as this format was interactive and expressive enough to suffice, while being much more technically simple and less demanding than an animated or virtual reality simulation.

We developed the visual novel using RenPy as an engine. Starting with the script that the GTI provided us, we improved the engine to give the player the ability to speak up during another character's dialogue, and run a special, separate part of the script—thus changing the flow of the conversation. Every aspect of our approach was carefully considered, and presented to the GTI, who consistently provided feedback on our progress based on their expertise in cultural differences.

The design of the engine, in particular, evolved from our requirements. Each character in the conversation is conceptualized as an *Agent* in the visual novel, and each spoken line as a *Statement*. Agents are given certain cultural orientation values on four axes: View of Time, Relationship/Task Orientation, Communication Style, and Hierarchy/Equality Orientation. Statements may also convey such values to listeners, and the trust between listeners and the speaker changes depending on the conflict between the orientations conveyed by the Statement and the listener's own orientations.

As it came time to implement interjections (the player's aforementioned ability to speak up at any time) into the script, it became apparent that simply writing the script in RenPy's native format wouldn't work without too many repetitive lines of code. Though RenPy already supports branching dialogue, it only does so at specific predefined points in a script, so each line of the script needs to have its own set of labels and control flow statements. To that end, we built a preprocessing function, which reads a text file and creates a RenPy source file from it—using metaprogramming to write the repetitive code necessary for our interjections. This also gave us more freedom in how we used RenPy's engine, allowing us to change how Statements were defined, and make interjection declarations more broad. Later in the project, we also added GUI elements (Fig. 1) that display various properties of each statement, and the current degrees of trust between all participants of the conversation, to the player of the visual novel, to help them decide when to speak up.

Towards the later stages of the project, we also designed an experiment to evaluate whether the

simulation was successful in its goal of training



Fig. 1 – The GUI of our visual novel engine.

cross-cultural interactions. The Institutional Review Board approved the study, putting us in a great position to begin the human subjects phase of the research in the near future.

IV. RESULTS/CONCLUSION

By the end of the semester, we created a fully functional and easily extensible visual novel engine, which tracks changes in trust between conversational participants based on the cultural orientations that they express, and can alter the conversation accordingly. The next stage of the project is to evaluate the tool's effectiveness for training and iterate on the design.

Additionally, while this tool was developed with one specific scenario in mind, it was also designed to be as extensible as possible. Another future task is to adapt our engine into a general-purpose tool for writing interactive conversations, which can support future projects in other domains.

V. PERSONAL REFLECTION

This project began without a concrete form, as more of a hypothetical than anything. Having the GTI collaborate on the project was helpful, as they provided a specific product to work towards. Communication between us and them also helped to refine the type project we aimed to create – initially, it began as a conversation tree generator, as opposed to the more simple conversation simulator it became. The underlying goal of creating a dynamic and interactive conversation engine for the purpose of cultural training remained the same throughout the project.

The experience of doing undergraduate research was also very important to me personally; it has taught me a lot about both the structure of research in the field of computer science, as well as my own

preferences and limitations in this domain. The experience will certainly influence the way interpret and interact with other research in the future, as well as the way in which I structure my own research in the future. Communication, especially, was an important point of learning; there were examples of good communication and bad communication in different parts of this project, both of which I can learn from.

REFERENCES

- [1] Armstrong, R. N., Sisson, R., & Page, J. H. (1988). [“Cross-Cultural Communication Training in Business: A Sensitizing Module.”](#) Proceedings of the Seventh Annual Eastern Michigan University Conference on Languages for Business and the Professions, p.21.
- [2] Schmitz, J. (2012). [“Understanding the Cultural Orientations Approach: An Overview of the Development and Updates to the COA.”](#) TMC Inc.
- [3] Tarter, L., Walch, K., & Schmitz, J. (2014). *Maximizing Business Results with the Strategic Performance Framework*. Training Management Corporation.
- [4] Tobias, Sigmund, J. Dexter Fletcher, and Alexander P. Wind. "Game-based learning." *Handbook of research on educational communications and technology*. Springer New York, 2014. 485-503.