

# Argument-based negotiation and conflict resolution through enactive role play in Second Life

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**Abstract:** This paper proposes the use of an immersive virtual environment, Second Life, for enactive role play to help students recognize and solve conflicts through argument-based negotiation. An important core of the epistemology of negotiation is that stakeholders in a dispute have legitimate conflicting interests, and the goal of negotiation is to reconcile those interests in an equitable manner given the constraints of the situation. In this study, students role-play as lead negotiators for parties in a dispute concerning a fictitious island which seeks to join the community of regional and international democracies after decades of totalitarian government. The discourse corpora of five student groups across two enactment sessions were analyzed using an adapted collaborative argumentation framework. We present the results of a two-step analysis approach that involves an initial single dialectical move analysis and a sequential analysis for pertinent moves and patterns within the virtual interaction. We discuss how these dialectical and sequential moves impact upon students' acceptance or non-acceptance of a conflict resolution. We conclude with a discussion on related pedagogical implications.

**Keywords:** argumentation, negotiation, immersive virtual environments, enactive role play

## Introduction

Advances in network technologies have resulted in the emergence of virtual worlds designed to facilitate synchronous communication between users. Today's virtual worlds are immersive, animated, 3D environments that operate over the Internet, giving access to anyone in the world. Examples of such worlds include Active Worlds, Second Life, and Blaxxun. Using virtual worlds for education has significant potential to foster constructivist learning, putting students in contact with others in an immersive environment that challenges them to work things out for themselves. Previous studies have shown that students are increasingly comfortable with this kind of learning, and, for many, avatar-to-avatar activity is as real as face-to-face contact [1]. Indeed, behind every avatar is a real person controlling the avatar's actions and words. If students consider avatars legitimate representations of themselves and of others, opportunities flourish for meaningful interactions among a broad range of students and other users, regardless of their physical location. Moreover, virtual environments have been touted as transformative spaces that can encourage innovative learning strategies which ultimately work to change the design and delivery of traditional curriculum [2].

Given the pedagogical potential of virtual spaces, this paper presents a research study that utilized an immersive learning environment for enactive role play, based on Second Life (SL), to help students recognize and solve conflicts through argument-based negotiation in the context of General Paper (GP), a compulsory subject for pre-university students in Singapore. Our research team hosted an exploratory exercise, piloting how

students might interact and learn in the process of a simulated negotiation to develop a better understanding of the process of globalization and its social, economic, and personal consequences. Given that the skills of argumentation, critical thinking, and writing are highly valued both in the context of GP and in the real world, it is intended that students will engage more effectively in critical thinking and argumentation related to the topics of concern as they take on relevant roles related to the problems and issues of the fictitious island, thinking, speaking, and acting on those issues from the perspective of a unique persona.

## 1. Second Life Virtual Environment

Second Life is an Internet-based virtual world developed by Linden Lab, which enables its users, called "Residents", to interact with each other through motional avatars, providing an advanced level of a social network service combined with general aspects of a metaverse. Residents can explore, meet other Residents, socialize, participate in individual and group activities, create and trade items (virtual property) and services with one another. According to Brandsford and Gawel [3], Second Life makes it possible to create interactive learning experiences that would be hard to duplicate in real life.

For this study, a private island, YouTopia (see Figure 1) was developed within the teen grid of Second Life. It is intended that the name of the island, “*You*Topia”, seeks to convey to students that, as residents of the island, they can create their own perfect or ideal society. The social state of the island depends on them; what happens in this world essentially rests upon their power to enact how they want things to be and their ability to negotiate issues from their own perspective.



Figure1. YouTopia in Second Life.

Within YouTopia, a context for globalization was developed. We provided the role structure for the enactments in the form of five interest groups of a fictitious island: native peasants, women’s peasants, International Monetary Fund, a non-governmental organization (NGO), and a multi-national corporation. The settings for these five groups were designed to convey the differing status, power, and resources between the groups. For example, the native peasants had a simple, bare shack as their meeting place in YouTopia while a concrete office building, fully furnished with office furniture and equipment, was designed for the multi-national corporation interest group.

## 2. Argumentation Analysis

Research to date on analyzing arguments appears to suffer from at least two limitations. The first limitation relates to identifying the argumentative processes within a larger process of

dialog, since the analysis concentrates on purely argumentative objects of the discourse: theses and arguments [4]. In the practical context of a dialog, the outcome is emergent through the advancement of individual arguments leading to either a conflict resolution or a non-resolution. This is very much dependent on the general dialog which runs parallel to the theses and arguments. In separating the parallel processes of argumentation and general dialog, a disconnect arises as these processes are very much linked to each other [4].

The second limitation relates to the multi-functionality of utterances in an argumentative dialog. Multi-functionality of utterances has been regarded as an essential component of pragmatic competence [5, 6]. An utterance that appears to be a suggestion may in fact be a request or vice-versa; thus context is vital for reliable interpretation of the speaker's intention. The dialogic activity of argumentation is oriented toward resolution of a conflict. Hence, analyzing argumentation dialogs consists of the identification of problem-solving functions of utterances, i.e. the manner which each utterance contributes to the resolution of the various problems encountered throughout the dialog [4]. While previous studies offer a predominantly linear and uni-dimensional approach [7, 8] to analyzing argumentation discourse features, this study seeks to offer breadth and depth in the scale of virtual argumentation by unpacking specific dialectical moves and sequences of chains of pertinent moves in argumentation as students work on negotiation with a view to reaching a decision on particular issues raised.

The model we used for analyzing argumentation (see Table 1) is adapted from [4] which offers a collaborative perspective of participants engaged in problem solving or conflict resolution [9].

Table 1. Dialectical functions.

Systematical Dialectical Analysis				Dialectical functions			
Interlocutory Orientation	Critical Operation	Dialectical Position	Thesis Angle	Dialectical function	Designation	Coding	
Speaker = Self Agent = Self	Take a Dialectical Position (DP)  <i>I say...</i>	Adhesion  <i>that I adhere...</i>	Self(MT) To my thesis	I maintain my thesis	Mn-MT	DP1	
			Other(YT) To your thesis	I accept your thesis	Mn-YT	DP2	
		Opposition (OPP)  <i>to not adhere</i>	Self(MT) To my thesis	I retract your thesis	Opp-MT	DP3	
			Other(YT) To your thesis	I oppose your thesis	Opp-YT	DP4	
	Argue (ARG)  <i>I give you a reason..</i>	Adhesion  <i>that I adhere...</i>	Self(MT) To my thesis	I argue for my thesis	Arg-MT	Arg1	
			Other(YT) To your thesis	I argue for your thesis	Arg-YT	Arg2	
		Opposition (OPP)  <i>to not adhere</i>	Self(MT) To my thesis	I argue against my thesis	Arg-Opp-MT	Arg3	
			Other(YT) To your thesis	I argue against your thesis	Arg-Opp-YT	Arg4	
	Speaker = Other Agent = Self	Take a Dialectical Position (DP)  <i>to express my position...</i>	Open choice(O)  <i>with respect to..</i>	Self(MT) To my thesis	I am asked to take a position w.r.t. my thesis	Q-MT	Q1
				Other(YT) To your thesis	I am asked to take a position w.r.t. your thesis	Q-YT	Q2
Take a Dialectical Position (DP)  <i>to confirm..</i>		Adhesion  <i>that I adhere...</i>	Self(MT) To my thesis	I am asked whether I maintain my thesis	Q-Mn-MT	Q3	
			Other(YT) To your thesis	I am asked whether I accept your thesis	Q-Mn-YT	Q4	
		Opposition (OPP)  <i>that I do not adhere...</i>	Self(MT) To my thesis	I am asked whether I retract my thesis	Q-Opp-MT	Q5	
			Other(YT) To your thesis	I am asked whether I oppose your thesis	Q-Opp-YT	Q6	
Argue (ARG)  <i>to give you a reason..</i>		Adhesion  <i>to adhere...</i>	Self(MT) To my thesis	I am asked to argue for my thesis	Q-Arg-MT	Q7	
			Other(YT) To your thesis	I am asked to argue for your thesis	Q-Arg-YT	Q8	
		Opposition (OPP)  <i>to not adhere...</i>	Self(MT) To my thesis	I am asked to argue against my thesis	Q-Opp-MT	Q9	
			Other(YT) To your thesis	I am asked to argue against your thesis	Q-Opp-YT	Q10	

DP-Dialectical position; Arg-Argue for; Q-Question/Ask about; Mn-Maintain/Agree; Opp-Oppose/ Argue against

As shown in Table 1, critical thinking operations (evaluations and elicitation) have the functions of taking *dialectical positions* (DP) and *providing arguments* (ARG). Dialectical

position refers to the argumentative orientation of the contribution, that is, to maintain or support (Mn) or to counter and argue against (Opp) the thesis. (ARG) reflects what one argues for or against. Where the speaker is himself or herself, the DP represents what one states or does in relation to a thesis. Where the speaker refers to others, the DP indicates if one is asked to express one's position with regard to a thesis, or to confirm or argue for or against a thesis. The thesis angle reflects the positioning of self or others to either my thesis (MT) or your thesis (YT).

Using this adapted framework, a two-step analysis approach was applied. It involves an initial single dialectical move analysis and a sequential analysis of chains of argumentative moves within each group of students. By identifying and detailing the fine levels of distinction each move plays in terms of positioning of students to themselves, to each other, to their theses, and to each other's theses, it allows for 'broadening and deepening in the space of debate' [10] in the virtual environment.

### **3. Research Objectives**

In this study, we discuss virtual spaces as experiential pedagogy in which student learning is formulated through interaction, negotiation, and collaboration. Importantly, we argue that virtual environments such as Second Life suggest that we should rethink existing learning approaches and enhance them with innovative tools that encourage identity affiliation and collaborative interaction to promote argumentation skills for critical thinking and writing. The scope of the study reported here is focused on identifying:

- how students, engaged in enactive role play, recognize and solve conflicts through argument-based negotiation in the GP, and
- the specific dialectical functions and sequences of chains in the argumentation process which impact these negotiation outcomes.

The findings are also intended to raise awareness of strengths and weaknesses in students' own argument structures, which will allow students to analyze and articulate the internal structuring of their negotiation process to each other.

### **4. Research Design**

This study forms part of a larger research project involving two cycles of a design experiment. The participants are 45 (23 male, 22 female) final-year pre-university students aged between 17 to 18 and who are of average to low ability in the GP subject (mean of recent standardized test scores was 51). The majority of the students come from families with predominantly middle to low income background residing in a typical public housing neighborhood estate.

Students role-played as lead negotiators in a globalization dispute concerning five interest groups of a fictitious Waga Waga (WW) Island which seeks to join the community of regional and international democracies after decades of totalitarian government. The students were randomly assigned to one of five special interest groups (native peasants, women's peasants, International Monetary Fund, a non-governmental organization and a multi-national corporation) consisting of four or five members per group. Students participated in two rounds of enactive role play sessions. In the first round of enactment (VR1), members from the five different parties sought to establish an alliance, raise questions about resolutions offered by other alliances, and address questions concerning their own resolutions. In the second round of enactment (VR2), students submitted their resolution for members of opposing alliance(s) to raise their questions or concerns about each resolution, after which the original resolution was amended. Each VR session lasted about one and a half hours. A same teacher facilitated both the enactive role play sessions.

Prior to these VR sessions, the teacher had gone through a series of classroom lessons introducing students to elements of Toulmin’s argument pattern [11], focusing specifically on claims, warrants, grounds, and backing. In addition, before VR1, students were given a list of gestures relevant to the domain of negotiation, to illustrate the state and possible outcomes of the negotiation process in the virtual environment [12], e.g. avatar frowning to indicate disagreement, or avoiding avatar eye contact to indicate disinterest.

## 5. Findings from single dialectical function analysis

The dialectical function Arg-MT (*I argue for my thesis*) had the highest frequency of use in both VR1 and VR2. Six dialectical functions had zero occurrences throughout the two VR sessions. Out of the remaining twelve occurring dialectical functions in VR1, the two highest occurring dialectical functions were arguing for one’s thesis (125) and arguing *against* another’s thesis (65), while the two lowest occurring functions were questioning the acceptance of another’s thesis (5) and arguing for another’s thesis (15). The two highest functions in VR2 were arguing for another’s thesis (107) and accepting another’s thesis (71), while the two lowest were questioning if one opposes one’s thesis (1) and questioning if one maintains one’s thesis (2). Figure 2 shows the detailed breakdown of the dialectical functions analysis for VR1 and VR2.

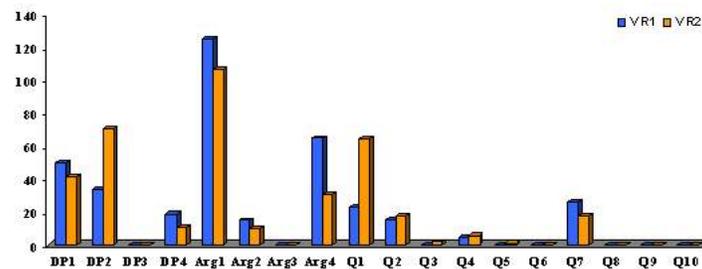


Figure 2. Distribution of dialectical function occurrences in VR1 and VR2.

### 5.1 Impact on negotiation outcomes

Can dialectical functions predict the outcome of the negotiation process? To investigate the impact of the dialectical functions on the negotiation outcome, a regression analysis based on the dialectical positions, argumentation types, and questioning types of the argumentation analysis framework was run. Each negotiation process was coded in terms of acceptance (successful conflict resolution), non-acceptance (unsuccessful conflict resolution), and unresolved (no conflict resolution). The results are presented in the following sub-sections.

#### 5.1.1 Dialectical position

The dialectical position which students took within a negotiation framework had a significant impact on their conflict resolution outcomes ( $F=8.88$ ,  $p<.01$ ). In further analyzing each function within the dialectical position framework, the least occurrence of opposing another’s thesis ( $\beta=-.564$ ) and acceptance of another’s thesis ( $\beta=.313$ ) had the greatest effect on the acceptance of the negotiated outcomes. Opposing another’s thesis was also the most significant predictor of the outcomes of the negotiation process ( $p<.01$ ).

Table 2. Regression analysis for dialectical position.

Variable <sup>1</sup>	Standardized $\beta$	Sig.
DP1	.178	.361
DP2	.313	.151
DP4	-.564	.008*

<sup>1</sup>DP3 was removed from the model due to zero occurrence; \* $p < .01$

### 5.1.2 Argumentation types in negotiation

Regression results suggest that argument types used in the negotiation process were a significant predictor of the outcomes of the negotiation process ( $F=7.491$ ,  $p<.05$ ). We observed a negative direction of the association between arguing against another's thesis to conflict resolution acceptance. The results suggest that arguing against another's thesis is a significant predictor relationship of the negotiation outcome.

Table 3. Regression analysis for argumentation type.

Variable <sup>1</sup>	Standardized $\beta$	Sig.
Arg1	.437	.098
Arg2	.137	.559
Arg4	-.551	.054

<sup>1</sup>Arg3 was removed from the model due to zero occurrence.

### 5.1.3 Questioning types in negotiation

There was no significant relationship between question type and students' negotiation outcome. This may be attributed to the fact that questioning type functions, apart from those requesting for position to be taken with respect to one or another's thesis, were limited. This leads to certain pedagogical implications that are discussed in section 7 of this paper.

## 6. Sequential analysis of dialectical functions

Extending the analysis to further unpack pertinent moves and patterns in argumentation, we conducted a sequence-chain analysis to uncover significant differences between the negotiation dialogue of a successful conflict resolution and a non-successful one. We sought to uncover types of dialectical functions which tended to follow others more often than what would be expected by chance [13]. To examine these *processes*, a discussion analysis tool was used to perform an analysis of event sequences using the method of sequential analysis [13]. The analysis reveals that the probability of a successfully negotiated outcome is highest when a negotiation is initiated by questions to probe for one's thesis (Q1) and questions requesting for arguments for one's thesis (Q7). In negotiation dialogs that involved the Q7-Q1 sequence, qualitative analysis showed that disagreements were more likely to be stated implicitly through the presentation of opposing arguments and critiques (Arg4).

To qualitatively illustrate the evidence, we provide excerpts of negotiation dialogs with two different outcomes: acceptance and non-acceptance. The data revealed that where negotiation broke down, there was ineffective dialectical dueling. Students failed to respond directly to queries raised, did not provide reasons to justify their case, and were unable to defend the position taken by the interest group they represented. The following dialog example, with names changed to preserve student anonymity, ended in non-acceptance:

- J1(WW): by the way C are you there? I asked you a question but you did not reply  
<avatar physically leaves the room>  
N (WP): he decided to go away from our country  
N (WP): \*country  
J1 (WW): oh I see  
N (WP): SO the NGOs i think they are not sincere enough to cooperate with us  
N (WP): THEREFORE, they should..... You know.. go away  
J1 (WW): he did not reply to my question  
J1 (WW): just keep urging me to join his alliance  
J1 (WW): without giving me reasons why I should join  
N (WP): He is not sincere. NGO has given up.

The question posed by the Waga Waga native, J, was not taken up at all by the avatar representing the NGO, C. The act of physically removing himself from the scene, in effect, worked against him as it suggested the insincerity of the NGO representative in not

wanting to pursue the matter further. In addition, as J pointed out to N, a representative from the women's peasants group, not only did he 'not reply to my question' but he kept 'urging me to join his alliance without giving me reasons why I should join.' By contrast, the following example illustrates a successfully negotiated outcome which made use of the questioning chain sequence and was further strengthened by the use of avatar gestures afforded by the virtual environment to implicitly convey agreement:

J2 (MNC): So what do you suggest?  
J2 (MNC): well the peasants rights must be maintained and they must not be exploited in any way  
D (IMF): the MNC will provide certain skills training  
J2 (MNC): Yes I got that already  
J2 (MNC): /laugh  
D (IMF): actually I think we are quite on the way of cooperating already  
J2 (MNC): Yes  
.....  
J2 (MNC): So is there anything you wish to add to the resolution?  
D (IMF): the MNC will get their monetary benefits, and the peasants will get a more stable income and a way of life  
J2 (MNC): /happy  
J2 (MNC): Yes

As evidenced in the excerpt, the invocation of J's 'laugh' gesture elicited a positive thought response from D—'actually I think we are quite on the way of cooperating already'—which created the amicable ambience for a successfully negotiated outcome. The sequential analysis of student Second Life logs showed that body gestures and posture can visually reinforce the ideas of a verbal message, strengthening the understanding of the communication context within a virtual environment.

## 7. Implications

The findings presented in this study provide an insight into the complex processes and patterns of interaction that occur in argumentation-based discussion in a virtual environment. First, we presented findings for argumentation dialectical functions used and their impact on students' negotiation processes. While students were at ease in maintaining their theses (DP1) and arguing for their theses (ARG1), what was markedly absent is the form of questioning that probes for another's strength of thesis (Q8, Q9, Q10). This finding suggests that there exists a need to provide structure for students' identification and formulation of specific question types and strategies to foster consensus building, while moving away from those that promote dissent in an argumentation-based negotiation. In addition, there is a need to widen the repertoire of questioning formats including subtle and less obvious ways of conveying sarcasm, disgust, and other emotive aspects in an argumentation-based negotiation.

Second, the sequential analysis of the negotiation process identified chains of the argumentation process that contributed to the acceptance or non-acceptance of the negotiation outcome. These results have important pedagogical implications that clearly indicate the need for more explicit instruction in strategizing specific moves that build on each other to impact on an individual's viewpoint or stance on an issue.

Evidently, the use of Second Life provided a concrete platform for sustained and focused interaction that allowed for a higher uptake in the dialoging process through specific argumentation moves in the process of negotiation.

The successfully negotiated resolution shown in the preceding section exemplified the use of affective gestures afforded by Second Life. It is noted that although students used significantly fewer gestures in VR2 as compared to VR1, the use of relevant gestures to reinforce what the student understood about the enacted character strengthened the non-verbal nuances of the negotiation process.

A number of barriers arising from the use of Second Life were also encountered as students participated in the argument-based negotiation processes. First, Second Life did not run smoothly on some of the participant's computers. While the school had made provision for participating students to use notebooks, each equipped with a high-end integrated graphics card and a substantially large video memory, there were many frequent upgrades on both server and client software for Second Life that took place during school hours, resulting in delays and loss of curriculum time. Second, although less frequent, there were occasions of unscheduled downtime for which teachers had to prepare contingency plans. Third, not every participant had prior virtual environment or computer gaming experience, resulting in an extremely frustrating initial experience. While it may be fairly easy or trivial for people with gaming experience to go through the Second Life orientation island and learn to move around in Second Life, first time users had difficulties with the navigation controls. We scheduled an hour long lab orientation session which helped the participants to explore the features in Second Life, navigate the virtual world, and use the communication features and gestures afforded by the environment. This orientation session proved helpful to those first-timers.

## 8. Conclusion

In this paper, we reported the use of Second Life for enactive role play to help students recognize and solve conflicts through argument-based negotiation. We described the complex processes and patterns of interaction that occurred in argumentation-based discussion in a virtual environment and highlighted the critical differences in dialectical moves and sequences of moves that impacted upon effective and ineffective negotiation in the argumentation process.

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## References

- [1] Virvou, M., Katsionis, G., and Konstantinos, M. (2005) Combining software games with education and evaluation of its educational effectiveness. *Educational Technology & Society*, 8(2), 54-65.
- [2] Hobbs, M., Brown, E., and Gordon, M. (2006) Using a virtual world for transferable skills in gaming education. *Innovation in Teaching And Learning in Information and Computer Sciences*, 5(3), 42-55.
- [3] Brandsford, J., and Gawel, D. (2006) Thoughts on Second Life and Learning. In *Proceedings of the First Second Life Education Workshop*, San Francisco, California.
- [4] Quignard, M. (2002) A collaborative model of argumentation in dyadic problem-solving interactions. In van Eemeren, F., Blair, J.A., and Willard, C. A. (eds.), *Proceedings of the Fifth International Conference of the International Society for the Study of Argumentation (ISSA'02)*, Amsterdam.
- [5] Thomas, J. (1995) *Meaning in interaction: an introduction to pragmatics*. New York: Longman.
- [6] Rose, K. R. (1999) Teacher and students learning about requests in Hong Kong. In Hinkel, E. (ed.), *Culture in second language teaching and learning*, (pp. 167-180). Cambridge, UK: Cambridge University Press.
- [7] Chandrasegaran, A. (2006) Secondary school students' stance-support strategies in online discussion: implications for the composition classroom. *English in Education*, 40(2), 22-39.
- [8] Cohen, R. (1987) Analyzing the structure of argumentative discourse. *Computational Linguistics*, 13, 11-24.
- [9] Clark, H., and Schaefer, E. F. (1989) Contributing to discourse. *Cognitive Science*, 13, 259-294.
- [10] Munneke, L., Andriessen, J., Kanselaar, G., and Kirschner, P. (2006) Discussing a wicked problem in a computer-supported collaborative learning environment. In Clarebout, G., and Elen, J. (eds.), *Avoiding simplicity, confronting complexity*, (pp. 197-208). Rotterdam: Sense Publishers.
- [11] Toulmin, S. (1958) *The uses of argument*. Cambridge, UK: Cambridge University Press.
- [12] Stark, P. B. (2000) *Nonverbal negotiation skills*. New York: Longman.
- [13] Wampold, B. E. (1992) The intensive examination of social interaction. In Kratochwill, T. R., and Levin, J. R. (eds.), *Single-case research design and analysis*, (pp. 93-132). Hillsdale, NJ: Erlbaum.