# A Conceptual Model of Intercultural Communication: Challenges, Development Method and Achievements

Emmanuel G. Blanchard[1], Stan Karanasios[2], Vania Dimitrova[3]

[1]Department of Architecture, Design, and Media Technology
Aalborg University at Copenhagen, Denmark
Emmanuel.g.blanchard@gmail.com
[2]AIMT Research Group, Business School,
University of Leeds, UK
s.karanasios@leeds.ac.uk
[3]School of Computing, Faculty of Engineering
University of Leeds, UK
v.g.dimitrova@leeds.ac.uk

**Abstract.** This paper argues that there is a need for integrating cultural considerations into AIED systems in order to enhance interactions between systems and learners. The development of a conceptual model of intercultural communication, the challenges encountered and the major achievements are described.

**Keywords:** Tutoring systems, intercultural communication, conceptual model.

## 1 Introduction

There is a large body of evidence which shows that the way people interpret and react to their environment significantly differs from one culture to another [1, 2]. When considering the wide range of human activities and situations influenced by culture, it is surprising to note that human-related technologies have only recently started to account for culture; and the domain of Artificial Intelligence in Education (AIED) is no exception. Indeed, AIED systems tend to focus on questions identified in Western contexts, resulting in design and solutions essentially inspired by Western authors, tested and validated essentially on Western samples [3].

This cultural imbalance in AIED research production, put together with well-documented cultural variations in situational understanding, interactions, and communication practices [1, 2, 4-12] bring forth the importance of considering cultural variations in AIED research. Specifically, we argue that two additional areas of research should become priorities for the AIED community:

- Investigating the applicative boundaries of previous AIED findings, assessing their universality or cultural specificity; and, possibly, initiating specific international collaborations and reflections on the most appropriate approaches to achieve these objectives.

- Developing innovative mechanisms to create more truly Culturally-Aware Tutoring Systems capable of manifesting cultural intelligence [4] in their inner mechanisms and interactions with learners.

Following initial developments (see [13] for an overview), one important emerging question facing the AIED community is *how* to *enhance interaction between AIED systems and learners by integrating cultural considerations?* By presenting a theory-grounded conceptual model of intercultural communication, with a particular focus on its nonverbal component, we contribute to this overarching research question and towards bridging the culture divide in the extant AIED research. Our model provides an ecology of notions as generic guidelines and structures that, we believe, can underpin AIED-related developments such as a) innovative designs for embodied pedagogical agents to allow learners to adopt a culturally-inspired and informed non-verbal communication style (see [14] for an example of enculturated agents), b) the development of automatic observation mechanisms to more appropriately interpret learners' body language, or c) the development of educational data mining techniques to analyze the resulting data. The research was undertaken as part of the ImREAL project developing a lightweight ontology to be used for semantic tagging of culturally rich social-web content [15].

This paper is organized as follows. Next, we introduce challenges in undertaking cultural research and strategies to mitigate the associated risks. We then describe the methodology followed to produce a conceptual model for cultural variations in interpersonal encounters. Following an iterative ontology development methodology, the conceptual model progressively evolved to include more and more 'heavyweight ontology'-inspired development practices. The resulting conceptual model is then presented and discussed. The paper closes with limitations and concluding remarks.

## 2 Challenges and Mitigation Strategies in Cultural Research

Many specific challenges are faced when addressing the cultural domain in a scientific manner. Firstly, while culture is a common topic of discussion in everyday life it remains ill-defined. And people, including scholars, not literate in this field often tend to adopt folk conceptualizations without even noticing it. The existence of a large body of cultural theories and frameworks tailored to specific tools and practices and focused on different aspects, also contributes to the difficulty in developing a clear and coherent scientific approach to this domain. The daily manipulation of cultural knowledge is also essentially implicit, i.e. most of the time people are unaware that they are culturally acting or interpreting and, when they are, it can be particularly difficult for them to thoroughly describe the situation with folk language only. It is thus extremely important for a project to have scientifically-acknowledged groundings that should, if possible, reflect different theoretical perspectives in order to obtain the broadest possible view about a cultural research question.

The research presented here has considered several cultural theories and frameworks. The essential ones are listed in Table 1. Some of them further propose strate-

gies to address the risk of relying on cultural stereotypes, another central challenge in cultural research.

Secondly, and as previously mentioned, people are frequently unaware that they are culturally interpreting information and such an 'unconscious' bias does not spare well-informed cultural researchers. Besides adopting a very cautious way of thinking, a possible solution for (at least partially) limiting this effect is to enforce collaborations between people with very different profiles that are then able to nurture the reflection process with enculturated experiences. This eventually results in the identification of way more cultural specificities.

**Table 1.** References and brief descriptions for theoretical groundings of the current project.

| Main references | Theory, framework, or study aspect |
|---|---|
| Memetic Theory [16] | A theory that suggests that cultural evolution shares similarities with genetic evolution. It is centered around the notion of 'meme' as basic cultural units i.e. the cultural counterpart to 'gene'. |
| Dual Inheritance Theory. See [17] for an overview. | A prominent contemporary approach to culture in evolutionary anthropology. |
| Sperber's Epidemiology of Representation [5] | Another influential theory in evolutionary anthropology that does not imply the notion of cultural replicators. |
| Distribution of cultural conceptualizations [18] | A psychology-based discussion on the notion of cultural conceptualizations, and on their distributions within cultural groups. |
| Culture and Cognition [6] | A psychology-based overview of cultural influences on cognitive processes |
| System of Values of Hofstede [7]. See [8] for a 25 year review of related studies. | Originally developed in the field of business/leadership, it remains the most commonly used framework in attempts to integrate cultural considerations in technology. |
| GLOBE system of values [9] | A system of values including both group and individual analyses. The main challenger of Hofstede's approach in business and leadership. |
| Schwartz Value Inventory [10] | Another system of values. |
| Cultural Intelligence [4] | Construct proposed in business/leadership to express, assess and improve behavioural, cognitive and affective intercultural skills |
| Cultural framework of Alwood [19] | A cultural framework that includes, but is not limited to, considerations for intercultural communication. |
| Framework for intercultural training of Bennett [20] | An approach for intercultural training that proposes a developmental model of intercultural sensitivity. |
| Research on specific cultural variations (e.g. [11]) | Research on cultural variations related particularly to emotion, facial expressions, and nonverbal behaviour. |
| Cultural Framework of Hall [12] | A cultural framework that suggests that *space, context* and *time* are essential dimensions to understand how people behave, communicate and impact on their living environment. |
| Politeness Theory [21] | A theory that suggests that there are universalisms in ways of ensuring politeness in interpersonal communication. |

The research team of the work presented is multicultural (Australian, French and Bulgarian nationals, with additional life experiences in the UK, Greece, Canada, Namibia, Japan, Denmark, and Germany) and benefits from discussions with collaborators from India and Germany. It also has a multidisciplinary expertise (computer science and social-science with advanced theoretical knowledge in educational and cog-

nitive psychology, anthropology, and communication), and includes experts in both 'lightweight' and 'heavyweight' ontology engineering [22].

## 3 A Hybrid Development Method

This heterogeneous expertise in ontology engineering is actually an interesting illustration of the needs for a conceptual framework on intercultural communication. Cultures are not always country-related, and can emerge in any communities, including scientific ones. For example, it can be said that members of the AIED community do share a mutual culture. Yet within this community, there are conceptualizations mainly shared by psychologists that are not necessarily adopted by computer scientists, and conversely. Similarly, people working on lightweight and heavyweight ontologies aim at producing an artefact they all refer to as 'ontology'. Yet the meaning they give to this term drastically differs, which leads to strong variations in typical development procedures. According to prominent ontologists [22, 23], while lightweight ontologists follow operational approaches to find a solution to a problem known a priori, heavyweight ontologists follow approaches similar to philosophy in an attempt to capture the true essence of a domain before even considering issues they could address with the resulting conceptualization.

Since this project collaboration was initiated by lightweight ontologists, the team first adopted a lightweight ontology development approach. However, with internal assessments identifying more and more complex conceptual issues, heavyweight ontology practices were incorporated progressively. This resulted in a hybrid artefact that cannot be fully considered as an ontology since it lacks significant details, which is why we refer to it as a 'conceptual model'. It appears as more formal than average lightweight productions without fully matching heavyweight ontology requirements.

The complexity brought with the inclusion of more heavyweight practices also led to more strictly characterize the conceptualization focus. Rather than tackling intercultural communication at large, it appeared more realistic to first concentrate essentially on its nonverbal component. Yet, basic conceptual structures have been identified to support future work in addressing intercultural verbal communication (e.g. cultural scripts. See [24]). The next sections describe the steps followed.

**Step 1. Adopting a glossary-centered approach.** Developing a knowledge glossary (KG) (or glossary of terms) consisting in a list of widely accepted terminologies and their definitions along with supporting references is a common practice to provide theoretical grounding to lightweight ontologies [25]. This quickly appeared to be a problematic approach for modelling the intercultural communication domain because of its multidisciplinary nature. Several issues were observed such as 'cultural discipline' communities relying on constructs with no counterparts in other communities, or terms being used in several disciplines but with different meanings associated to them. Furthermore, a large number of term candidates were identified, which made the task of obtaining a coherent KG difficult because of cognitive overload aspects.

**Step 2. Eliciting term interdependencies and providing a graphical representation.** The first revision focused on structuring elicited terms rather than just listing

labels and their definitions. Furthermore, this structuring was made graphical through the use of a concept map program, i.e. labels of selected notions were organized as a taxonomy-like tree while definitions and references for each of these labels (i.e. the KG) remained stored in a separate table. This provision of a graphical and structured overview of the KG facilitated the process, and further helped to reduce the list of term candidates by facilitating the identification of different terms labelling the same notion. Yet the structure remained was not optimal. More precisely, term categories were clearly emerging but no widely accepted labels existed for them.

**Step 3. Enhancing the structure with the inclusion of abstract notions.** The next methodological revision consisted in creating abstract categories to optimize the structure obtained in Step 2. Definitions for these categories had to be created since they did not exist in any specific cultural disciplines, but rather emerged from various perspectives analyzed altogether. None of these categories could thus be associated to an exact reference but rather to a body of supporting references. The resulting graphically-supported structure of labels and its associated KG then began to look satisfying. However, we wanted to expose our conceptualization to more cultural perspectives in order to better address threats of unconscious biases in cultural interpretations and the corollary risks of oversimplifying the problem.

**Step 4. Iteratively validating and revising the model with competency questions (CQ).** The use of CQs is an approach proposed to test that a model correctly covers its domain [25]. Briefly summarised, CQs are questions related to the domain such as "*are women and men normally allowed to make casual contact, e.g., shaking hands*?". CQs were collected from external experts and provided a vehicle to assess whether the model integrated appropriate notions to address them. We contacted people with expertise on culture-related topics (2 from the US, 2 from Germany, 1 from the Netherlands, 1 from Brazil, and 1 from the Philippines) and collected a total of 95 CQs, which were then used to assess the coverage of the nonverbal intercultural communication by our conceptual model. Due to space constraints, we cannot fully describe the systematic procedure followed. Each step was performed separately by two experts, followed by an in depth discussion to address identified limitations. Many CQs went beyond the nonverbal component of intercultural communication, with the resulting conceptual model being able to address them as well.

CQs were applied in an iterative manner. We divided them randomly into 3 sets of questions. The 1$^{st}$ set was used to analyze the model we had obtained after Step3, which led to significant updates. The new model was then tested with the 2$^{nd}$ set and a limited number of additional conceptual updates were adopted in a second revision. The 3$^{rd}$ set was eventually applied with no significant conceptual changes, which we interpreted as a sign that our model had achieved a proper level of stability and domain coverage. We argue that this approach is adequate when conceptualizing a cultural problem since it is not possible to find a source that concentrates the whole cultural wisdom and production of Mankind. In other words, there may always be a cultural group with specific and unforeseen interpretations for specific behavioral primitives. However, because of the stability we achieved, we hypothesize that future updates would remain light and expect that our model is dynamic enough to easily accommodate such limited evolutions.

This is indeed another important improvement resulting from CQ-based assessments. We identified that several notions in our model rely on complex combinations of contextual dimensions. Rather than attempting to list all possible combination instances (which we are confident is an impossible task), we have revised our model to include an easy mechanism for including new context 'descriptors' when needed.
This is one of the elements we discuss in the next section on the resulting production.

## 4 Resulting Conceptual Model

Figure 1 presents a simplified overview of the resulting conceptual model with the main concepts being introduced in the following lines.

Firstly, **culture** is seen as a cognitive phenomenon that emerges at group level [17] (see [3]). The main support for its exclusively cognitive nature is that cultures evolve through social learning processes [5, 17]. Cultural artifacts and behaviors are thus not directly transmitted. Rather, it is the way to design/construct/perform/etc. them that is socially shared (see the notion of cultural script below). Several cognitive constructs emerge in our conceptual model (see Table 3) with the most important ones for nonverbal intercultural communication being:

- **cultural norms** as "*a kind of grammar of social interactions. Like a grammar, a system of norms specifies what is acceptable and what is not in a society or group. And analogously to a grammar, it not the product of human design and planning*" [26];
- **cultural scripts** as prototypical procedures to be performed in a specific context and for a specific purpose. They are scripts as defined by [27]. The 'cultural script' concept was first introduced in linguistics [24] and social sciences [28] and is being expanded as part of the More Advanced Upper Ontology of Culture (MAUOC) project to address the non-universal nature of many cognitive scripts ([29]; see [30] for an outdated version; see also [31]);
- **stereotypes** as belief structures that influence the processing of information about stereotyped groups and their members [32]. They are *"sustained by selective perception and selective forgetting*" [33 p.196], and are *"socially-supported, continually revived and hammered in, by our media of mass communication*" [33 p.200].

As a follow up, it is important to clarify when intercultural communication practices, languages, and act are cultural and when they are not. This is achieved by assessing their innateness: if they are innate to human being (i.e. not acquired through social learning processes), then they are not cultural elements, which led us to identify **behavioral primitives** (gesture, posture, eye gaze, facial expression) as non-cultural because a new born baby could actually perform such things. However, what a baby cannot do is to perform these actions while associating a socially-learnt meaning to them. Such an association of behavioral primitives and socially learnt meanings are cultural and we refer to them as **Cultural Body Language Act** (CBLA see Table 2).

Another aspect of our conceptual model refers to the notion of **context**. Indeed several meanings can be associated to a behavioral primitive. Knowing which one applies in a specific situation depends on the ability to correctly identify contextual dimensions. Similarly, several cultural norms may be regulating nonverbal communi-

cation at a certain time, and are tightly depending on the context of occurrence. There are countless different contextual situations worldwide and it would be impossible to come to an exhaustive listing. We have thus defined **descriptors** as lightweight constructs to facilitate contextual descriptions (for a more heavyweight approach to context, see [30]). Descriptors are terms referring to qualities, properties, conditions, functions, or situations to characterize a contextual dimension. Several descriptors can be used to characterize a context. Example of descriptors can be 'politeness', 'gift', 'privacy', etc. virtually any terms that users may want to use as characterizations. Of course, a controlled vocabulary of descriptors would be better and, following CQs analyses, we already suggest several abstract descriptor categories (see Figure 1).

Finally, several additional notions specific to nonverbal intercultural communication have been defined in the KG with the main ones being listed in Table 2.

**Table 2.** Limited list of of definitions for nonverbal communication notions

| | |
|---|---|
| Cultural elements | Basic cultural units of information. Initially popularized under the 'meme' terminology from *Memetic Theory* [16]. Alternatives less supportive of the genetic-to-culture analogy have also been proposed in modern evolutionary anthropology theories like the *Dual Inheritance Theory* [17] and the *Epidemiology of Representation* [5]. |
| Cultural non-verbal communication | Communication system shared by a cultural group and acquired by its members through social learning processes (not innate [17]) which do not make use of oral language (e.g. [11]). |
| Cultural body language act (CBLA) | Behavioral primitives (gesture, posture, gaze or facial expression) or sequences of them associated with meanings, this association resulting from a sociocultural (not innate) learning process.<br>Gestures associated with meanings. May be used to enrich, clarify or elaborate our descriptions [34, 35].<br>Postures associated with meanings. A form of kinetic behavior, revealing important information on nonverbal communication and emotions.<br>Facial expressions associated with meanings. May be used to display affective states, which can repeat, augment, contradict, or be unrelated to verbal statements. Affect displays can be intentional or unintentional. Through facial expressions we can communicate our personality, open/close channels of communication, complement/qualify other nonverbal behavior, and communicate emotional states [2, 36]. |
| CBLA – abstract | Definitions of these abstract body language constructs focus either on the effect to be achieved, the functional objective, or features specific to instances of these abstract categories (see definitions of regulators, illustrators, adaptors, and emblems below). |
| Regulators | Maintain and regulate the back and forth nature of speaking and listening between two or more interactants. They are gesture movements that attempt to regulate a conversation: to shut someone up, bring others in, encourage them to continue etc [37, 38]. |
| Illustrators | Intimately linked to spoken discourse - actions accompanying speech such as finger pointing and raised eyebrows. They accompany and may amplify speech.[36, 38]. |
| Adaptors | Generally unconscious behavioral adaptations in response to certain situations. Actions used to act on objects or self-manipulative actions such as lip biting [36, 37]. |
| Emblems | Have a specific verbal translation known by most members of the communicating group. Usually the direct verbal translation consists of a word or two or phrase. Used often deliberately with the conscious intent to spread a message [34-36, 38, 39]. |
| CBLA- concrete | Clear and precise usage of specific (sequences of) behavioral primitives to convey a meaning in more or less specific contexts (e.g. agreement with head nodding, greeting act with handshake). |
| Cultural body Language | A system of CBLAs internalized by members of a specific cultural group. |

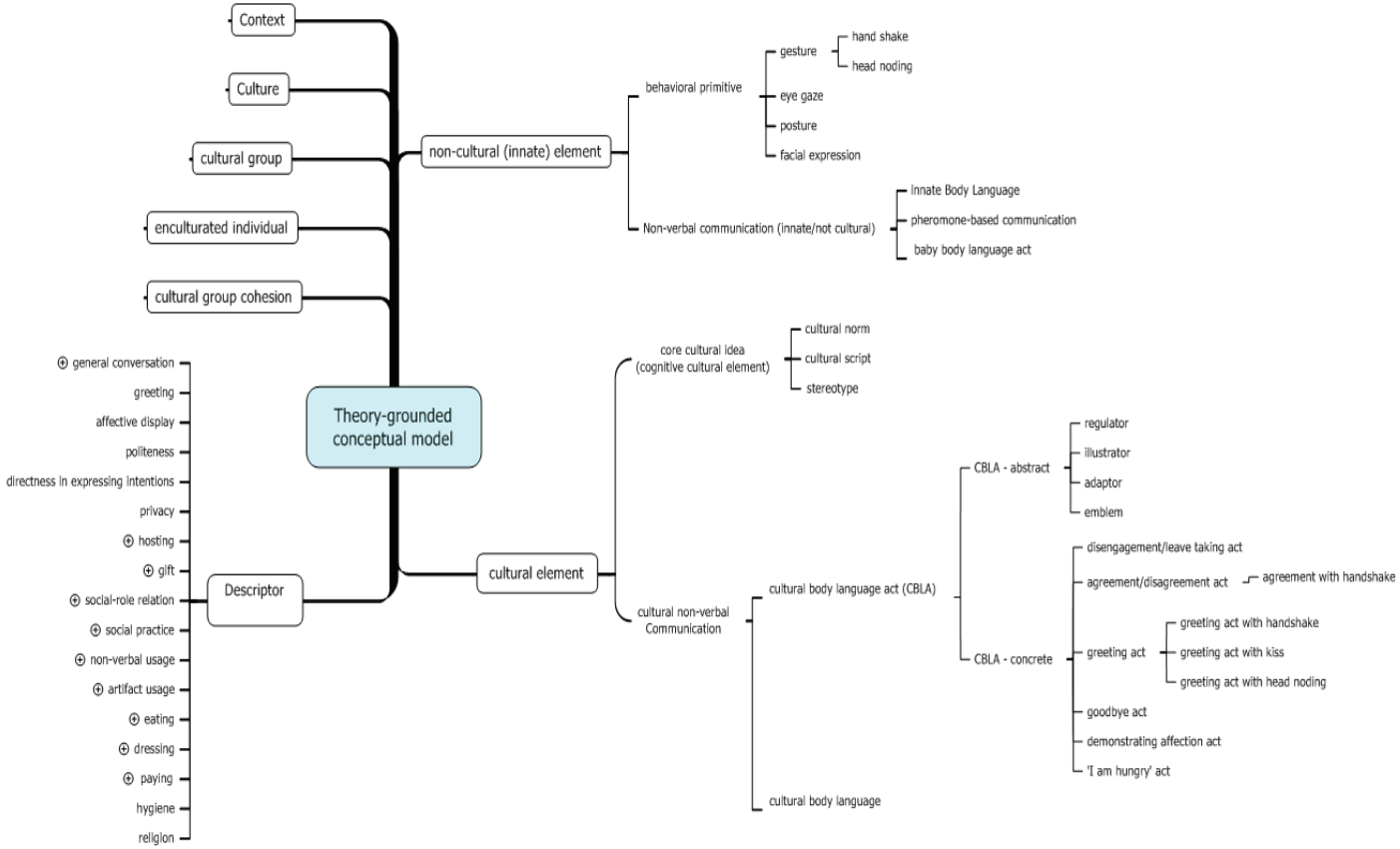


**Fig. 1.** Simplified graphical overview of the resulting conceptual model

## 5 Conclusion

We described the development of a conceptual model of intercultural communication in the context of addressing a cultural imbalance in the existent AIED research. The work presented is a step towards answering overarching research questions concerning how to enhance interactions between AIED systems and learners by integrating cultural considerations. As with all research that focuses on culture, some qualifications are in order. Whilst our research team encompasses a wide range of cultural backgrounds, we do not claim we account for every cultural perspective. The CQs captured the perspectives of 6 domain experts, producing 95 questions. Within the boundaries of our research we maintain that this was sufficient, however future research may build on this by including a broader perspective and greater volume. We have encoded the conceptual model in a lightweight ontology whose applicability for annotating user-generated content to capture cultural variations in nonverbal communication is currently evaluated. The conceptual model will also inspire heavyweight ontology developments in the context of the MAUOC project [29, 30].

## 6 Acknowledgement

This work received funding from the European Union Seventh Framework Programme (FP7/2007-2013) under grant agreement no ICT 257831 (ImREAL project) and the Medialogy Department of Aalborg University.

## References

[1] J. Henrich, S. J. Heine, and A. Norenzayan, "The weirdest people in the world?," *Behavioral and Brain Sciences,* vol. 33, pp. 61-83, 2010.
[2] B. Mesquita, N. H. Frijda, and K. R. Scherer, "Culture and emotion," in *Handbook of cross-cultural psychology:* . vol. 2, P. Dasen and T. S. Saraswathi, Eds., ed Boston: Allyn & Bacon, 1997.
[3] E. G. Blanchard, "On the WEIRD nature of ITS/AIED conferences: A 10 year longitudinal study analyzing potential cultural biases," in 11th International Conference on Intelligent Tutoring Systems (ITS2012), Chania, 2012. pp. 280-285.
[4] P. C. Earley and E. Mosakowski, "Cultural Intelligence," *Harvard Business Review,* vol. October, pp. 139-146, 2004.
[5] D. Sperber, *Explaining culture: A naturalistic approach*. Oxford: Blackwell, 1996.
[6] R. E. Nisbett and A. Norenzayan, "Culture and cognition," in *Stevens' Handbook of Experimental Psychology*. vol. 2, D. Medin and H. Pashler, Eds., 3rd ed New York: John Wiley & Sons, 2002.
[7] G. Hofstede, Hofstede G.J., and M. Minkov, *Cultures and organizations: Software in the minds*. New York: McGraw-Hill, 2010.
[8] B. L. Kirkman, K. B. Lowe, and C. B. Gibson, "A quarter century of culture's consequences: a review of empirical research incorporating Hofstede's cultural values framework.," *Journal of International Business Studies,* vol. 37, pp. 285-320, 2006.
[9] R. J. House, P. J. Hanges, M. Javidan, P. W. Dorfman, and V. Gupta, *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* Thousand Oaks: Sage, 2004.
[10] S. H. Schwartz, "Beyond individualism/collectivism: New dimensions of values," in *Individualism and Collectivism: Theory Application and Methods*, U. Kim, H. C. Triandis, C. Kagitcibasi, S. C. Choi, and G. Yoon, Eds., ed Newbury Park, CA: Sage, 1994.
[11] D. Matsumoto and C. H. Hwang, "Cultural Similarities and Differences in Emblematic Gestures," *Journal of Nonverbal Behaviors,* vol. 37, pp. 1-27, 2013.

[12] E. T. Hall, *The Silent Language*. New York: Doubleday, 1983.
[13] E. G. Blanchard and A. Ogan, "Infusing Cultural Awareness into Intelligent Tutoring Systems for a Globalized World," in *Advances in Intelligent Tutoring Systems. Studies in Computer Sciences* R. Nkambou, R. Mizoguchi, and J. Bourdeau, Eds., ed Berlin: Springer, 2010, pp. 485-505.
[14] B. Endrass, M. Rehm, and E. André, "Towards culturally-aware virtual agent systems," in *Handbook of Research on Culturally-Aware Information Technology: Perspectives and Models*, E. G. Blanchard and D. Allard, Eds., ed Hershey, PA: IGI Global, 2010.
[15] S. Karanasios, D. Thakker, L. Lau, V. Dimitrova, D. K. Allen, and A. Norman, "Making sense of digital traces: from activity theory to ontology," *JASIST,* forthcoming.
[16] R. Dawkins, *The selfish gene*, 3rd ed. Oxford: Oxford University Press, 2006.
[17] J. Henrich and R. McElreath, "Dual inheritance theory: The evolution of human cultural capacities and cultural evolution," in *Oxford Handbook of Evolutionary Psychology*, J. Dunbar and L. Barrett, Eds., ed Oxford: Oxford University Press, 2007.
[18] F. Scharifian, "On cultural conceptualizations," *Journal of Cognition and Culture,* vol. 3, pp. 187-207, 2003.
[19] J. Allwood, "Intercultural Communication. English translation of: "Tvärkulturell kommunikation"," *Papers in Anthropological Linguistics 12,* vol. University of Göteborg, Dept of Linguistics, 1985.
[20] M. J. Bennett, "A developmental approach to training for intercultural sensitivity. Int. J. of Intercultural Relations," *Int. J. of Intercultural Relations,* vol. 10, pp. 179-196, 1986.
[21] P. Brown and S. C. Levinson, *Politeness: Some universals in language usage*. New York: Cambridge University Press, 1987.
[22] R. Mizoguchi, "Tutorial on ontological engineering - part 1: Introduction to ontological engineering.," *New Generation Computing,* vol. 21, pp. 365-384, 2003.
[23] B. Smith, "Ontology," in *Blackwell guide to the philosophy of computing and information*, L. Floridi, Ed., ed Oxford: Blackwell, 2003, pp. 155-166.
[24] C. Goddard and W. A., "Cultural scripts: What are they and what are they good for?," *Intercultural Pragmatics,* vol. 32, pp. 153-166, 2004.
[25] M. F. López, A. Gómez-Pérez, J. P. Sierra, and A. P. Sierra, "Building a Chemical Ontology Using Methontology and the Ontology Design Environment," *Ontologies,* pp. 37-46, 1999.
[26] C. Bicchieri and R. Muldoon. (2011, March 14). *Social Norms, Stanford Encyclopedia of Philosophy*. Available: http://plato.stanford.edu/entries/social-norms/
[27] R. C. Schank and R. Abelson, *Scripts, Plans, Goals, and Understanding*. Hillsdale, NJ: Earlbaum Assoc, 1977.
[28] H. C. Triandis, G. Marin, J. Lisansky, and H. Betancourt, "Simpatia as a cultural script of Hispanics," *Journal of Personality and Social Psychology,* vol. 47, pp. 1363-1375, 1984.
[29] E. G. Blanchard and R. Mizoguchi, "An introduction to MAUOC, the More Advanced Upper Ontology of Culture, and its interest for designing Culturally-Aware Tutoring Systems," *Research and Practice in Technology Enhanced Learning (RPTEL),* forthcoming.
[30] E. G. Blanchard , R. Mizoguchi, and S. P. Lajoie, "Structuring the cultural domain with an upper ontology of culture," in *Handbook of research on culturally-aware information technology: Perspectives and models*, E. G. Blanchard and D. Allard, Eds., ed Hershey PA: IGI Global, 2010.
[31] E. G. Blanchard, "Is it adequate to model the socio-cultural dimension of e-learners by informing a fixed set of personal criteria? ," in *12th IEEE Int. Conf. on Advanced Learning Technologies (ICALT2012)*, Roma, Italy, 2012, pp. 388-392.
[32] J. T. Jost and D. L. Hamilton, "Stereotypes in our culture," in *On the Nature of Prejudice: Fifty years after Allport*, J. Dovidio, P. Glick, and L. Rudman, Eds., ed Oxford: Blackwell, 2005, pp. 208-224.
[33] G. W. Aalport, *The nature of prejudice*. Cambridge, MA: Perseus Books, 1954/1979.
[34] A. Kendon, "Some topics in gesture studies," in *Fundamentals of verbal and nonverbal communication and the biometric issue*, A. Esposito, NATO Programme for Security through Science., and North Atlantic Treaty Organization. Public Diplomacy Division., Eds., ed Washington, DC: IOS Press, 2007, pp. 3-19.
[35] D. McNeill, *Gesture & Thought*. Chicago: University of Chicago Press, 2005.
[36] M. L. Knapp, *Nonverbal communication in human interaction*, 2nd ed. New York: Holt, Rinehart and Winston, 1978.
[37] P. Ekman and W. V. Friesen, "The repertoire of nonverbal behavior: Categories, origins, usage, and coding," *Semiotica,* vol. 1, pp. 49-98, 1969.
[38] A. Furnham, *Body Language at Work*. Channel Islands, UK: The Guernsey Press, 1999.
[39] T. Wharton, *Pragmatics and Non-Verbal Communication*. Cambridge: Cambridge University Press, 2009.