Communication Models Used in the Online Learning Environment

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Abstract
The inter-human communication is a continuous process: a person receives, decodes and interprets messages (according to his/her own semantics) and encodes information in his/her answers. In 1954, Schramm and Osgood defined the circular communication model, according to which feedback is the most important. Communication is described as a continuous process consisting in messages sending and receiving feedback. Starting from the circular communication model, it is proposed a model of communication that can be used in the online learning environment.

Keywords: multi-modal semantic communication, conversation theory, e-learning.

1. Introduction

New informational technologies permit the students to learn using computer-based collaborative models. The computer-based collaborative techniques are relatively new. The preoccupations of the researchers in the field of instructional design have focused on the collaboration models among learners. In this paper it is emphasised the communication model as support to both collaborative and unintentional learning.

“What children can do together today, they can do alone tomorrow.” (Vygotsky, 1962).

The computer-based collaborative learning does not replace the classroom collaboration; much more it offers new opportunities to learn. The frontiers caused by distance, cultural education, age differences, emotional states, and so forth are beyond.

Theories such as the communication theory and the conversation theory establish expandability as a new feature of learning. The expandability of learning refers to the fact that learning can appear anywhere, anytime, in different ways, even unintended.

The objective of this paper is to propose a model of communication that can be used in computer-based collaborative learning combining the communication theory and the conversational theory.

2. Communication and Conversation Theory

The communication theory was developed in 1940 in the same time with the instruction theory. Shannon and Weaver realised an approach of the quantification and measuring information developing the general model of communication system as
support of communication. (Shannon, 1948) Schramm adopted the linear model of Shannon and Weaver to human communication, including a new concept of field of experience, like parameter of message understanding. (Schramm, 1965) The inter-human communication is a continuous process during which human beings encode and decode the signals and information is encoded in answers.

The main components of online communication used in the learning process are the context of communication, the background of knowledge, experiences, and a positive attitude towards learning. The term of feedback in inter-human communication was issued in the circular model of Schramm and Osgood, presented in the figure no. 1. (Schramm, 1954) The participants on the communication process assume both the role of transmitter and the role of receiver.

![Figure 1. The Circular Model of Inter-human Communication (Schramm and Osgood)](image)

In essence, there are two types of communication: direct communication between two or more persons and mass communication.

Mass communication refers to the process of producing and freely delivering messages to a large and heterogeneous audience. The online learning process implies a mass communication with or without restrictions and a personalised communication. The consequence of issuing the new communication channels is Schramm’s model of mass communication. The Schramm’s model of mass communication is described by McQuail and Sven, as presented in the figure no 2. (McQuail and Windahl, 1981)
Summarizing, there are more perspectives of the communication theory:

- The technological perspective: the transmission mechanism is significant and the effect of transmission is not essential – Shannon and Weaver model;
- The psychological perspective: the messages are filtered and processed – Schramm and Osgood model;
- The social and cultural perspective: concerned with social interactions and building collaboration groups.

Gordon Pask developed the conversation theory and that was used to develop educational programmes. (Pask, 1975) The fundamental idea of the Pask’s theory is that learning occurs through conversations about a topic. All these conversations have a finality: knowledge building. The method of learning, according to the conversation theory is “teachback”, i.e. a person teaches another what he/she has already learned. Pask observed a conversation and defined the “skeleton of a conversation”.

The term used to express the learning as effect of conversation is conversational learning. Conversational learning is viewed “as the experiential learning process as it occurs in conversation” (Baker et all., 2002). A dialectical approach to the conversational learning can be found in (Baker et all., 2002).

Face-to-face communication is a multi-modal process, if we take into consideration the fact that one communicates using verbal, visual, kinesthetic expressions. In the virtual spaces the communication must be multi-modal. The models of communication used in the online-learning environments needs to incorporate multi-modality and
conversational spaces. In the virtual spaces, the multi-modal communication emulates face-to-face communications. In the paper entitled Multimodal approaches (Project I Curriculum: The knowledge and Information skills needed for living in the digital age http://promitheas.iacm.forth.gr/i-curriculum/), it is shown the necessity of the multi-modal approaches in the education: “the skills needed in the digital age might incorporate all modes that are now possible (combining voice, audio, text, images, …) and that a new literacy approach is necessary to allow the students to use not only mode by mode, but a combination of different modes, thus approaching outcomes to a more natural and holistic interaction”.

3. Communication Models Used in the Online Learning Environment

The model developed by Laurillard entitled “Conversational Framework” facilities learning as an iterative dialogue between teachers and students. The interactions proposed in (Laurillard, 2002) operate at two levels. The former is the theoretical and conceptual level and the latter is the practical level. This approach enables students to link theory to practice and allows teacher to evaluate whether he/she has set or not the adequate tasks for the learning outcomes.

The Laurillard’s model “captures the essence of university teaching as an iterative dialogue between teacher and student(s), operating on two levels: (1) the discursive, theoretical, conceptual level and (2) the active, practical, experiential level—the two levels bridged by each participant engaged in the processes of adaptation (practice in relation to theory) and reflection (theory in the light of practice).” (Laurillard, 2002)

The model developed by Salmon has five stages: stage one is named Access and Motivation; stage two is named Online Socialization, stage three is the Information Exchange stage, stage four is the Knowledge Construction and stage five is the Development stage. (Salmon, 2000, 2002) The model proposed by Salmon is presented in detail at http://www.atimod.com/e-tivities/5stage.shtml.

In this paper it is proposed a model considering the theories presented in the previous section. The model has to integrate two perspectives: the technological perspective and the pedagogical one. The technological perspective has three dimensions: the human-machine communication, the machine-machine communication, and human-human communication. The pedagogical perspective has to incorporate conversational spaces (in this model, collaborative techniques are included in the conversational spaces).
Figure 3. Perspectives of Communication in Online Learning Environment

Technological model assures the technological base of communication (hardware and software). Some technologies that can be used to support communication are (Rosenberg, 2006):

- E-mail;
- Mailing list;
- Discussion threads, chatrooms, forums;
- Web conferencing;
- Audio conferencing;
- Knowledge network building tools;
- News groups;
- Response pads;
- Whiteboard;
- Shared screen;
- Weblogs.

A detailed description of the way in which these technologies supports collaboration is described in book *Beyond e-Learning* (Rosenberg, 2006).

In this paper, it is presented a communication model taking in consideration the aspects from above.
Figure 4. A Communication Model Proposed to Use in Online Learning Environment

The model presented in the figure no. 4 (Moise, 2008) has three components: the teachers group’s component, the learner’s group component and the machine’s group component. The forms of transfer and sharing information allowed in this model are: one-to-one, broadcast, somebody-to-somebody and everybody-to-everybody.
The communication is realized within each component and between components. The messages can be personalized or identical. The reactions are obtained on the basis of logical deductions that confer the inferential feature to the feedback.

The major problem in this model is the communication within machines group and the communication with the machines group component. A solution to solve it is to use the intelligent agent technology. In this case, the messages have to be more or less “arbitrary”, more or less “standardized”. All messages have to be understood by the participants in the communication process.

A semantic communication protocol has to be defined according to the instructional goal of communication in online learning environment. Semantic communication can be defined using three types of ontology: ontology of the delivered course, ontology of online learning environment and an ontology of the e-course’s specified domain. The model has to achieve semantic interoperability between machines and between machines and human beings. The communication process can be both verbal and non-verbal. The problem of interpretation of multi-modal messages is a difficult problem. In the figure no. 5 it is shown a multi-modal communication schema between two entities. The entities A and B can be both transmitter and receiver and the entity B is a machine.

4. Conclusions

The paper presents a multi-modal communication model that can be used in the online learning environment. Work of the author is currently underway to explore the paradigm of multi-modal semantic communication. The research directions are to define an interpretation mechanism of multi-modal messages in an online learning environment.

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