Sequences of Discourse in e-Learning Environments

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Abstract

In this article we describe the research we have carried out aimed at contributing conceptual and methodological tools to help in understanding better how online teaching and learning works. We develop a qualitative analysis of asynchronous forum of several e-learning courses identifying sequences or moves of teaching discourse.

Introduction

The new forms of online communication involving telematic (the integrated use of telecommunications and informatics, also known as the science of sending, receiving and storing information via telecommunication devices) are a great challenge when conceptualizing what has traditionally been understood as communication in education. One of the most prolific topics in the recent literature on communication in the educational context concerns the instructional use of the new technologies. It is therefore not surprising that a review of the specialized bibliography reveals many references to the concept of *computer-mediated communication*.

Blanton, Moorman, and Traten (1998) proposed organizing the forms of communication in virtual environments, differentiating between convergent and divergent situations, depending on the interpretations of the users. Starting from that work, Shotsberger (2001) analyzed synchronous dialogues in chat rooms by applying various categories: statement, beliefs, concerns, practice, wishes, intention, query, and result.

There have been recent attempts to go beyond the mere description of the messages in forums of asynchronous communication, conceiving them as an opportunity to promote knowledge and learning. The landmark work of Henry (1992) propounds that asynchronous communication can be analyzed from five dimensions: participative, social, interactive, cognitive, and metacognitive. Later, we will look at her contribution in detail.

Davis and Brewer (1997) have focused their interest on the **analysis of electronic discourse**. For them, "*electronic discourse is one form of interactive electronic communication. In the study we reserve the term for the two-directional texts in which one person using a keyboard, writes language that appears on the sender monitor and is transmitted to the monitor of a recipient, who responds by keyboard. The recipient may actually be an individual, or a group, large or small, of receivers*" (p.1). Electronic discourse is complex and has multiple facets. The authors choose to work from the field of discourse analysis for two reasons: because the different levels of discourse analysis allow textual analysis, and because discourse analysis is intrinsically multidisciplinary in nature.

The term electronic discourse centers on the way people use language to exchange ideas, rather than on the medium they use. The analysis performed is not that of conversation, because discourse analysis is asynchronous, with an immediacy in retroaction and response that sometimes, as we

have already indicated, may be restrictive. There is a time-lag in interaction between the sending of a text and its response. Electronic discourse also differs from face-to-face communication in the to-and-fro, since interruptions and overlaps are not possible. In electronic discourse, interactivity has two poles: that of the message sender and that of the respondent.

One of the findings of the work of Schrire (2002) was to illustrate that the typical pattern of *Initiation-Response-Reaction,* so frequent in face-to-face interaction, is not the norm in asynchronous contexts, and that when it does occur, the third exchange is more probably between students than between students and teacher.

Gunawardena and others (1997) used a theoretical approach to develop a model for analyzing transcriptions of online discussion forums. Through an analysis of content, they developed a system to analyze knowledge building in social interaction, identifying five phases in the evolution of online discourse. Other studies have centered on analyzing the forms of electronic interaction, such as discussion, information sharing, reflection, and formulation of high- and low-level queries. Zhu (1998) described the styles of student participation: the way someone searches for information, what they ask, what guides them, what contributes, and whether the participation is vertical or horizontal. In vertical interaction, certain members of the group make use of the proposals of others with greater knowledge. In horizontal interaction, the members express their own ideas without there having been prior correct responses.

Context of the research

Having described the basis of our research, we now go on to describe the procedure and the results obtained. Firstly, the study we present is based on the analysis of messages sent to discussion groups of 10 courses of e-learning that we have organized in the University of Seville. These courses are part of master or doctorate activities of the university. They varied in duration between six months and a year.

All our e-learning courses have been carried out on the LMS WebCT platform, which enables the setting up of discussion groups in e-learning courses. The total number of students taking part in the courses was 217, with 29 instructors. Some of the latter were present throughout the courses, while others were present occasionally.

The total number of messages sent to the forums of the 10 courses was 5624, distributed as displayed in the Figure above. We can see in this case something that is habitual in analyzing interaction in e-learning courses: the percentage of communications generated by students is considerably greater than that by teachers: 64.7% of messages were sent by students, against 35.3% by instructors.

Procedure for data analysis

For the analysis of the messages, we used a system of categories. This system was based on the results of the model developed by Anderson, Garrison, and Rourke, which we have already mentioned. As will be remembered, those authors distinguished three great dimensions in the analysis of online interaction: social, cognitive, and instructional presence. From these, and certain of the subcategories devised by those authors, we generated a system of categories. This system was applied semi-inductively:

- we created a first system of categories from the dimensions devised by Anderson, Garrison, and Rourke

- we generated the subcategories used by those authors in their research
- we selected two of our forums for the initial application of the first system of categories
- the research team, comprising three coders, coding them independently
- the unit of codification chosen was the complete message. As a result, some messages could be codified with more than one category
- the team of codifiers who had worked independently met to find common ground in comparing the codifications made
- when encountering new situations that could not be included in any of the initial categories, we created a new one
- each new category was defined and classified so that it could be properly integrated into the overall system

Sequences and structures of discourse

We have mentioned briefly some of the results obtained from the analysis of frequency of appearance for some of the categories of our system analyzing instructional interaction in virtual spaces of learning. We have not gone into detail on this analysis for obvious restrictions of space.

However, together with the category analysis, we have propounded the study of the different sequences produced in these spaces of communication that could lead to configuring what Bellack described as movements of discourse, something we have already referred to earlier. Such analysis requires certain considerations due to the specific nature of CMC.

In constructing the following diagrams, we took into account all the possible forms of discourse structuration, respecting the conditions of associations among codes established for the category system used. In part, we used a series of analyses enabling us to know the most-common interactive structures occurring in the forums. However, some observations are in order:

- the routes proposed for the sequences of interaction correspond to a particular way of structuring the discourse, categorized as *direct teaching* in the system of categories
- the intrinsic nature of the system for recording the messages (forum), and the asynchronous nature of the communication, mean that sequences of interventions are retained in a peculiar fashion (as compared with those produced in face-to-face sessions). A student entering the forum reads these sequences, and intervenes in them, in an order that is topic- or chronologically based
- the sequences of intervention were extracted from their natural context without being modified
- the sequences of interaction represent **patterns of interaction**, as they are frequently repeated during the discourse
- the diagrams present the *patterns of interaction* in routes comprising two, three, and four levels of intervention in the discourse

Sequence 1. First route: Structuration > Reaction > Structuration

INSERT FIGURE 1

Discourse in the forum usually originates from structures of initiation, presenting topics related with course programming. These structures result in messages expressing reactions continuing the topics, attempting to amplify or complement the ideas presented, from new sources. Such reactions take different sides in the discourse. While some continue in chains of new reactions, others end in new topics or raise questions.

A *student* in the course wants to comment about an assignment she has just done on learning environments. This assignment concerns a test that analyzes the style of learning within such environments. She believes it to be an interesting tool because it provides the means to improve the weak points of our personality and reinforce learning capacity. In **reaction** to the comment, an *instructor* continues with the idea put forward, offering more information about the tool. The instructor announces the name of the test, and indicates the aims of the tool. The intervention that follows is that of a *student* responding to a proposed course activity.

Sequence 1a. Second route: Structuration > Reaction > Question

Citing one of the articles proposed for an activity of a course module, a *student* promotes debate on habits and values in computer networks. The topic is followed up by the reaction of another *student*. This new intervention provides fresh ideas; including an evaluation. Following up these latter ideas, a third *student* expresses his agreement, and reacts by raising several questions.

Sequence 1b. Third route: Structuration > Reaction > Reaction

A *student* intervenes with a comment on the compatibility of a learning platform in the Linux environment. This comment is reacted to by an *instructor*, who not only shows his agreement but also provides new information regarding the learning platform. The same *student* who began the topic reacts, agreeing with the content of the instructor's participation.

Interpretation of these sequences:

The start of a topic, opening discussion in the forum, is a source from which can spring possible reactions that evaluate, complement, amplify, or simply continue the ideas expounded. These reactions can be preceded by interventions that
a) mean a change in the sequence of the thread [Structuration];
b) raise questions provoked by reactions in the thread [Queries]; or
c) show new reactions agreeing or not with the earlier one [Reaction]. In this last case, we find examples where the second reaction is not necessarily from the person who started the discussion.

Sequence 2

INSERT FIGURE 2

Sometimes, many of the topics being dealt with in the discussion of the forum for the first time lead to queries of different sorts. From then on, we find two possible routes in the discussion: in one, the queries that give rise to several interventions with responses, or those that receive a response that in turn raises a new query; in the other, those queries that lead to reactions intending to evaluate, clarify, synthesize, or amplify the idea in question.

Sequence 2a. First route: Structuration > Question > Response > Question

An *instructor* indicates that one of the course modules is already available for its study on the learning platform. The following message is from a *student* who, concerned about logging on to the module just opened, expresses the doubts he has about finishing the activity of the preceding module, and asks several questions about procedure. As a result, a second *instructor* offers general replies to each of the questions raised. The sequence finishes with a message from the same student who raised the questions, in which he acknowledges the replies given, and uses the opportunity to raise further questions aimed at clarifying those replies he has not understood.

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Sequence 2b. Second route: Structuration > Question > Reaction

An *instructor* alerts the students to the importance of changing the personal passwords for logging on to the learning platform hosting the course, and at the same time reminds them to fill out an initial questionnaire evaluating aspects of the course. A *student* intervenes, asking for help on how to change her password. In reaction, an *instructor* gives a practical explanation of how to learn the technique.

Interpretation of these sequences

We should make a first observation regarding the structures of initiation of topics and questions. The sequence of structures is usually contained in the same message, as we have shown in the second route. What distinguishes it from the messages whose discourse begins with structures is precisely that the following structures offer new options that these do not.

Topic-derived questions can result in specific replies that raise further questions seeking to clarify or go deeper into the first. However, these questions can also be followed by several responses, as after a general question. Another possibility is when the topic-derived question produces a reaction which is a step-by-step explanation of how to understand something or how to perform some practical task, or seeks to clarify problems encountered in more technical learning.

Sequence 3
INSERT FIGURE 3

In the discussion in the forum, we find sequences of interventions that seem uncommon. Such is the case of sequences that begin with one topic, followed by the presentation of a totally new one. The second topic can then take in interventions with new topics, or reactions to previous ideas or contentions.

Sequence 3. Route: Structuration > Structuration > Structuration

In this case, we find three interventions of *students*, each of whom states an opinion regarding the reading of various articles proposed as a course task. This activity promotes discussion in the forum.

Interpretation of this sequence

The repeated appearance in the forum of sequences with structures could have various explanations:
- A first can be taken as the moment when the forum becomes a space for gathering the different opinions of the students as a response to an activity.
- Another could be the greetings of students when they enter the forum for the first time, and which often accompany proposals of new topics.
- A final reason could be the coexistence of topics referring to the course and topics referring of leisure in the same sequence. It is clear that such sequences can result in new structures of discourse such as questioning or reaction.

Conclusions

The processes of learning have become more complex due to the rise of the new technologies, especially the Internet. The possibilities of open and flexible collaborative learning have awakened

the interest of teachers and researchers in investigating and understanding the conditions and features that the new learning methods can contribute. If, as teachers, we can be pleased about the possibilities of a pedagogic change that e-learning can bring about, as researchers we must not stop questioning ourselves about the quality of these processes of education and learning.

In this article we have described the research we have carried out aimed at contributing conceptual and methodological tools to help in understanding better how online teaching and learning works. In conducting this research we have not started from scratch. We have taken advantage of the considerable advances made in earlier decades by research on the analysis of instructional interaction. However, we have — inevitably — gone further, adapting the traditional principles to the new learning environments.

Research on learning in virtual contexts is still in its infancy (Wallace, 2003). Research must be undertaken to give responses and clarify how these processes work and what helps to improve them. Relationships have to be established between teacher-student discourse and the results, both of students' learning and their level of satisfaction (Gunawardena & Zittle, 1997). At the same time, it is necessary to investigate the nature itself of online teaching and learning: how it is produced, what mechanisms drive it, and how to promote and evaluate it. Research is also needed on the constitution, configuration, and structure of the groups created in online classes, where there is no physical contact between the class members — How do students work in virtual groups? What leadership styles are developed?

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