

# Interactions in the discussion forum: a study about virtual learning communities

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**Abstract:** Based in the studies developed by Rheingold (2000) and Castells (2001) we can verify that virtual communities are new technological support for sociability, providing new forms of interaction. On the other hand, Pallof and Pratt (2002) point out that the virtual learning community is the space where online learning occurs. This way, this paper presents a study of the interactions in a discussion forum in order to analyse if the concept of virtual learning environment is feasible. The employed methodology uses a qualitative approach based on the content analysis of the messages. It is understood that this study can contribute to research in the distance learning area, mainly with methodology for online education.

**Keywords:** virtual learning communities, interaction, distance learning

## 1. Introduction

This study contributes to research in the distance learning area, focusing the investigation on virtual learning communities (VLC), based in the studies developed by Rheingold (2000), Castells (2001) and Pallof & Pratt (2002).

According to Paloff and Pratt (2002), the virtual community is the vehicle through online learning occurs. They points out indications that an online community is taking place: active interaction, collaborative learning, socially constructed meaning, resources shared by students, exchange of motivating expressions between students and the desire to critically evaluate the work of classmates.

To Rheingold (2000), “virtual communities are social aggregations that emerge from the Net when enough people carry on those public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace”.

Castells (2001) indicates that virtual communities are new technological supports for sociability, different from other forms of interaction, and the virtual communities are based on two fundamental common characteristics:

(a) The value of free and horizontal communications characterized by online communication from many to many;

(b) Autonomous formation of webs that involve the possibility given to each person to find their own destination in the Net and, when not found, to create and communicate their own information, which induces the formation of a network.

In this perspective, this study aims to discuss if the concept of VLC is feasible in distance learning. Many questions are enrolled in this study: how to encourage the interaction that will determine the formation of virtual learning communities? Are there characteristics in the posted messages in a discussion forum that can improve interactions between students? A possible research route involves the content analysis of the messages in a discussion forum.

In this perspective, this paper presents a study of the interactions that take place in a virtual learning environment, especially in the discussion forum. In particular, the study aims to investigate the processes involving the formation of virtual learning communities. The employed methodology uses a qualitative approach based on the content analysis of the messages. This study can contribute to research in the distance learning area, with methodology for online education.

## **2. Methodology**

As said before, this research involves the content analysis of the messages posted in a discussion forum in order to investigate the processes involving the formation of virtual learning communities in online classrooms.

According to Bardin (2007), content analysis (CA) is a set of techniques to analyse the communications procedures and uses systematic and objective description of the content of the messages. Initially, it was used to discuss journalistic material, and especially, the political symbols. Between 50's and 60's, the CA has spread to another area of social sciences.

The content analysis is used to determine the presence of certain words or concepts within texts or sets of texts. This methodology has a quantitative or qualitative approach. In a quantitative approach, CA fixed in the amount of repetitions that occur in a text, while a qualitative approach looks for a missing or abundant data in the structure of message.

In the CA there are some rules to help the analyst sort and classify posts. According to Bardin (2007) the analyst, in his work of pruning, is considered one that defines the units of coding, or for the record. If there are ambiguities in the direction of the referencing elements encoded, it is necessary to set units of context.

The record unit is the most specific code language, such as a word or a phrase. The context unit refers to more complex structures in which the analyst should not extract the own meaning contained in the code, but the proposed meaning by the author of the examined proposition. In this case, the analyst needs to place it within the review context. It is from the establishment, by the analyst, of the record and context units that can begin the content analysis. This, according to Bardin (2007), is usually done by two different methods named Frequencial Deduction and Analyse by Thematic Categories.

The Frequencial Deduction consists in enumerate the occurrence of the same language sign (a word - records unit - for example) that is frequently repeated, looking for the direction of this repetition. This technique is not concerned with the direction contained in the text, nor the difference between the meaning of a text and another, worried more with statistical analysis than the meaning of its application.

The Analyse by Thematic Categories emerges from the disintegration of the text in units, in order to find meanings in the indicators made by the author. However the interpretation of these indicators depends on the researcher. He has experience with the subject, sensitivity, ability to assess and deal with the information, for a better or worse (correct or not) evaluation of the message.

In this study the content analysis of the discussion forum follow the three steps proposed by Bardin (2007): pre-analysis, material exploration and processing, and results interpretation. These steps are explained below.

## ***2.1 Steps for conducting an analysis***

Bardin (2007) points out that the CA is constituted from three stages: pre-analysis, material exploration and processing and interpretation of results.

### **2.1.1 Step 1: pre-analysis**

To Bardin (2007), content analysis starts with the definition of the context unit and the record unit.

This study focus the analysis by thematic categories. These categories were defined based on previous work involving the study of interactions in virtual Learning Environments (VLE) (Behar et al, 2005, Bassani, 2006).

According to Behar et al. (2005), the design of a model to map the interactions in VLE is based on the constructivist-interactionist approach, in which the individuals cannot be defined if not in association with the elements of the environment.

Individuals, based on the concept of psychological subject defined by Dolle (2005), is understood as a “system made up of elements in interaction with each other.” The psychological subject is made up of four subjects: bio-physiological,

affective, cognitive and social. At the same time, environment is defined by Dolle (2005) as a system of relations made up of subjects, objects and rules. Therefore, each interaction produces a different distribution according to the points of contact with the environment and, therefore, constitutes different contexts of analysis. A proposal to map contents in VLEs originated from studies of the dimensions that constitute the VLE subject, that is, the cognitive, technological, social and affective dimensions. These dimensions are complementary and each interaction between the subject and the environment produces different points of contact. At a specific time point, one dimension may be more evident than the others. Therefore, four conceptual axes were defined for the analysis of VLE interactions according to message contents:

- (a) Epistemological: involves all that refers to or characterizes the knowledge construction process of the object of study;
- (b) Technological: refers to the management of technological aspects and questions intrinsically related to technology;
- (c) Social: refers to knowledge construction in a collective community by means of both individual and inter-individual relationships;
- (d) Affective: is characterized by the expression of feelings, emotions and desires.

After the definition of the categories, the next step was to select the context unit and the record units. The record unit has been characterized by the messages posted on the discussion forum. Moreover, the context unit involves the grouping of various record units on the same discussion topic. Thus, considering a hierarchical forum structure, the context unit is the original topic (here understood as statement) and its vinculated answers. The table below (Table 1) shows a context units consisting of two record units .

Table 1 – Context unit and record units

	<b>RIVED (SEED - MEC)</b> [ Agent1 - 11/08/2008 13:54:47 p.m.] For colleagues who do not know the Rived yet, it is a Educational Program of the Distance Education Secretary - SEED, which aims the production of digital educational contents in the learning objects form. Such contents stimulate the reasoning and critical thinking of students, involving the potential of computing to new teaching approaches. <a href="http://www.rived.mec.gov.br/">http://www.rived.mec.gov.br/</a>
>>	<b>Re: RIVED (SEED – MEC)</b> [ Agent2 - 11/08/2008 17:49:34 p.m.] XXX, interesting you bring the learning objects (LO) issue. It is important to know the difference between an educational software and a learning object - many people think it is the same thing.
>>	<b>Re: RIVED (SEED – MEC)</b> [ Agent3 - 11/08/2008 16:14:15 p.m.] An important feature of Rived for open source software and content defensors: the contents produced by Rived are public and will be, increasingly, licensed by Creative Commons. Such contents can be accessed through the research' system - online repository, which allows you to view, copy and comment the published content. Source: <a href="http://www.cybion-atv.blogspot.com/2007/12/rived.html">http://www.cybion-atv.blogspot.com/2007/12/rived.html</a> . According Primo (2001) it is what really characterizes the real interaction, because the result of these comments can not be predicted in advance, creating a

	real collaboration and interaction word sense.
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### 2.1.2 Step 2: material exploration

In this second stage data are collected from the record unit. Messages were collected from the discussion forum of three online classes on computer science area, during the second half of 2008. Each professor choose one forum and authorize the research.

In the analysis, we proceeded, primarily, the decomposition of entire forum in context units. Then, within each context unit, were separate the record units. As indicated above, the contents of the messages was examined based on the theoretical framework proposed by Dolle (1393) and revisited by Behar et al (2005). Thus, the messages were classified as the predominant route: epistemological, technological, social or affective.

In some cases, however, due to the nature of the message, it was not possible classify the register within a predominant category. There were, thus, besides the four main cathegories, record units involving two prevailing strands, such as epistemological/social or social/emotional.

The table below shows the amount of context units and record units of each forum, including the duration of the discussion (in days).

Table 2 - General view of the analysed data

Subject	Context Unit	Record Unit	Duration (days)
Subject A	19	26	13
Subject B	13	44	8
Subject C	11	40	7

### 2.1.3 Step 3: interpretation of data

The analysis of the record units demonstrated the predominance of messages in the epistemologic cathegory.

This fact is explained because the analysed forums are part of discussions that take place in a formal educational environment involving graduate students.

In Subject A, there were listed 26 record units, classified as following: epistemologic, 18; social, 1; espistemologic-social, 5; technological, 2.

In Subject B, there were listed 44 record units classified as following: epistemologic, 38; epistemologic-social, 5; social, affective, 1.

In Subject C, were listed 40 record units classified as following: epistemologic, 22; social, 10; affective, 3; espistemologic-social, 4; social-affective 1.

The quantitative analysis presented few indicators for a study which wants to understand the set up of the virtual learning communities. So, it is understood that the analysis of the messages must be done based on a qualitative approach. The discussion of the results is detailed in the next section.

### 3. Results

The qualitative analysis of the discussion forum tried to map the interaction between different context units. So, it was possible to show up that the incident of some kinds of messages launches the conversation and interaction. From the investigated material it was possible to perceive different situations:

a) no interaction: When the different agents involved in the discussion put their messages in an isolated form, as presented in the Table 3. It is realized that this situation has a tendency to take place when the message has epistemologic meaning, because the messages have a tendency to be complete, not inciting the exchanges. So, the discussion is characterized for isolated speech, very often straightly explaining the studied subject.

Table 3 – Discussion without interaction

Context unit	Record unit	Predominant category
Racial discrimination in Brasil		E
	<b>Interactions</b>	<b>1</b>
Afirmative action		E
	<b>Interactions</b>	<b>1</b>
Afirmative		E
	<b>Interactions</b>	<b>1</b>
Afirmation		E
	<b>Interactions</b>	<b>1</b>
Afirmative actions		E
	<b>Interactions</b>	<b>1</b>
Programo of fees		E
	<b>Interactions</b>	<b>1</b>
Afirmative actions' politics		E
	<b>Interactions</b>	<b>1</b>
Positive action		E
	<b>Interactions</b>	<b>1</b>
Afirmative action		E
	<b>Interactions</b>	<b>1</b>

Context unit	Record unit	Predominant category
Afirmative action		E
	<b>Interactions</b>	<b>1</b>
Afirmative action		E
	<b>Interactions</b>	<b>1</b>

b) Interaction without articulation: it was possible to perceive this situation when the discussion is grouped in the same context unit, but there is not articulation between the different messages. The students participate of the same context unit of the discussion, but each one puts his own message, characterizing different answers for a start question. As well as in the previous situation, this model has a tendency to take place when messages have epistemologic meaning.

Table 4 – Interaction without articulation example

Context unit	Record unit	Predominat category
Project manager's responsibilities	1	E
	2	E
	3	E
	4	E
	5	E
	6	E
	7	E
	8	E
	9	E
	10	E
	11	E
	12	E
	13	E
	<b>Interactions</b>	<b>13</b>

c) Interaction with articulation: this situation occurs when the discussion is grouped in the same context unit and shows interactions between messages; it is characterized by the presence of epistemologic-social or affective-social categories in record units. In this kind of record unit the text of the message refers to the content in study, but also presents possibility of opening to the conversation with other, as following:

c1) The subject answers to a question/reflection, calling the interlocutor by his name. An example of this kind of interaction can be seen in a message from the Forum C, presented following:

>	<b>Re: Re: What is Educational Software ?</b> [ XX - 08/08/2008 17:44:20]
>	X, as I understands, the Pascal and C are not "educational softwares", just a programming language, is this, tools through them other softwares are developed, and these developed softwares, yes, can be an educational softwares . A hug, XX.

c2) The subject launches one asks. This kind of interaction is exemplified following, in a message from the Forum C:

>>	<b>Which the kind of Educational Software?</b> [ XX - 06/08/2008 21:35:00]
	I found a classification of Educational Softwares according to the Educative Bases of National Development Programme in Computer Assisted Learning (1973-1975)( <a href="http://www.ufmt.br/ufmtvirtual/textos/se_tipos.htm">http://www.ufmt.br/ufmtvirtual/textos/se_tipos.htm</a> ): *Instructive paradigm; *Revealing paradigm *Conjecture's paradigm Does anybody risk saying to himself what they mean?

c3) The subject reports personal impressions about others. Following its possible to see an example of this kind of interaction, in a message form Forum B:

>>	<b>Re: The project's manager must...</b> [ XX - 16/03/2007 19:23:13]
	the project's managers task isn't easy. He must to manager the direction, the time, the costs, the quality, human resources, risk and acquirings. But the above qualities are useless without the quality of to manager the integration with all these elements. So, he grants that the several project's elements be coordinate of a correct form, negotiating the conflicts for the project's objectives and alternatives, with the objective to reach or exceed the needs and expectations of all the involved parts.

The table 5 presents the evidences of situation described in this paper as interaction with articulation

Table 5 – Interaction with articulation

Unity of context	Unit of register	Predominant category
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What is educational software?	1	E
	2	S
	3	S
	4	E
	5	S/A
	6	S/E
	7	A
	8	E
	9	S
	10	E
	11	E
	12	S
	<b>Interações</b>	<b>12</b>

#### 4. Final considerations

The study suggests that interactions with articulation promote the participation and enrolling of the students in a discussion forum;

It seems that the messages containing double predominant category (social-epistemologic or affective-social) have the tendency to stimulate and continue the discussion in an online classroom. These have motivated the thinking about the possibility to post messages based on social or affective categories to improve the formation and maintenance of virtual learning communities.

Otherwise, the results of the study indicate that the situations called “no interaction” or “interaction without articulation” can take the discussion to the end.

This research allowed us to understand that the study of the interactions in a discussion forum is important to the comprehension of the processes that are part of the formation and maintenance of virtual learning communities.

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