

STATISTICAL TRAINING IN HUMANITIES AND SOCIAL SCIENCES IN GROUP AND AT DISTANCE: EXPLORATION OF THE EFFECTS OF TEACHING AND LEARNING ON COLLABORATIVE WORK THROUGH THE OBSERVABLE TRACES OF SOCIAL INTERACTIONS IN A SYSTEM OF ONLINE DISTANCE EDUCATION

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This paper focuses on the organization and content of social interactions in a group of students engaged in learning Statistics. The importance of social interactions in the teaching and learning is largely based on socio-constructivist theories. We intended to look at the micro-level exchanges between students engaged in a complex task oriented teaching. Technical constraints and spatio-temporal characteristics influence on contributors engaged to achieve the common goal. This observation was made through quantitative and qualitative analysis of messages exchanged in a discussion of students. Learning Statistics through distance education and in a group situation are a new framework of experience. 'What is at stake' when a group of students learns Statistics without direct meetings, among themselves and with the teacher was the main question of the study.

INTRODUCTION

This study was designed to explore the relationships among students working in groups as part of a course at Master degree level in Education, with the ultimate aim of learning statistics through e-learning. This learning mode was based on the assumption that technical and spatio-temporal constraints affect social practices (Régnier, 2003). The importance of social dimension in a learning context is a prehistoric concept, developed largely by socio-constructivist theorists. Thus the work done in the years 1970s and 80s, on the concept of socio-cognitive conflict (Perret-Clermont, 1986) highlighted the social dimension of development of intelligence and the role of interactions in individual's cognitive development.

Social interaction is beauty of life and can be made by physical co-presence, by telephonic call or by exchange of letters (Goffman, 1973). Use of Internet, has changed the modes of informal and non formal education. Technical progress is accompanied by a change in social practices, especially with the proliferation of social networks. The Internet is not only a spectator but is also an actor, in interacting with others and exchanging all kinds of data. The social practices of students are gradually modified by this digital media. The units like place, time, action that characterize the classroom in the traditional education is disrupted (Glikman, 2002) and lead to redefine the educational area and its educational components. Learners located in different geographical locations, can gather on the same virtual space for study. Indeed, these online collaborative practices are quite different from those experienced in face-to-face, requiring adaptation on the part of individual performers. "Working and learning in groups involves mobilizing a number of social skills needed to advance the achievement of the task and / or likely to grow throughout the collaborative situation" (Simeone, Eneau & Rinck, 2007). The major aspect of this mode of communication is written, that confines the indices of socio-emotional behavior (sight, posture, voice) present in the face-to-face relationship. The time dimension is also changed by distance education because much work is done on discussion forums or e-mail, which is an asynchronous mode of communication. The messages are recorded in digital format and can be replayed later. They are like a memory of the group of learners, available at any time.

METHODOLOGY AND EDUCATIONAL BACKGROUND

A naturalistic observation of recorded messages on a forum dedicated to students involved in collaborative work for training and assessment at digital campus FORSE (Formations et Ressources en Sciences de l'Éducation), University of Lyon, Lyon2-France within the framework of methodology course 'Research Methods and Statistics' was made. The tasks listed were both at

the individual and collective order. This work was valued and integrated into the overall assessment for obtaining the degree of Master in Education. Micro observation of this specific area of work was being conducted. These data were then given the subject of content analysis. To identify the meaning of the message content, and to assess the evolutionary aspect, observation was made on three periods and a categorization by themes (Bardin, 2007). Each phase observed took place over eight days in early, mid, and late in the session (sub-corpus P1, P2 and P3). For each sub-corpus, the corresponding coding units of meaning have been presented in a matrix of raw data to reveal the presence or absence of an element in a descriptive and comparative way.

RESULTS OF OBSERVATION

The collaborative work session took place over a period of six and a half months from September to April (199 days) and analysis of data helped to make the following observations:

Quantitative Aspect

This data consisted of three hundred thirty nine messages, eight of which were filed by three students from outside the study group. In most cases, the action of filing a message triggers another action on the same mode, namely the issuance of a new message. The discussion of six male students, corresponding to a message, originated messages and responses that followed it were recorded during the session.

Table 1. Number of messages submitted by students

Students	A	B	C	D	E	F
Number of messages	114	66	11	47	46	47

Out of these messages, one hundred ten contained an attachment which is almost one third of the whole data. These attachments were essentially the files which contain data related to collaborative work in progress. This facility of transmission of digitized documents was emphasized in a context of collective work. This technological possibility was not without relevance to the learning process by contributing to the rapid exchange of knowledge.

Qualitative Aspect

There were visible actions like filing messages, respond to messages and file attachments. The traces of these actions were observable at any time and stored as constituting the corpus analyzed. There were also actions not visible, but were mentioned in the message content, such as references to external actions, e.g., to call, to find information, to meet on a virtual space for a chat. Some messages remained unanswered; some were very structured which engaged the male participants. The number of visible interactions varied widely during the session, with periods of intense activity where all available actions on the forum were simultaneously involved, and for a period of one month (Nov. 7 to Dec. 6), no message was deposited on the forum. The messages were sent prior to all group members. Otherwise, the sender specifies the recipient, either in the introductory part or in the body of message. The message content was very diverse with greetings, exchange of knowledge on the course content or information (technical, organizational), references to external events (chats, phone calls, personal life) with emotional aspects in particular emoticons which can give messages of significant emotional tones. Each thread was part of a unit of time defined by the publication dates of the first and last message. The modal value was 16 days, and extreme variability was found over the months. The average on the whole session was 4 days per discussion.

Several different discussions took place simultaneously, which were not possible in face-to-face. A discussion was made of at least two messages. The modal value was sixteen messages, with an average of six posts per thread on the whole session. A schematic presentation of communication showed generally linear form of discussions (Regnier & Pradeau, 2009). A significant variation exists regarding the message size. Shortest includes a single word, "Here", accompanied by an enclosure. The longer includes 626 words, which is considerable. In face-to-

face, this action would be considered a monopoly of speech, even if the rule used in the context of forum is rather concise messages frequently refer to concepts of space. The purpose of the message originator of the first discussion indicates “Here” as an attempt to define a common workplace in space totally intangible digital campus. These references to areas outside the study forum, places chat or telephone appointments (either synchronous interaction) are consistent in the first two corpora (one message in three in P1, a message in five P2, none in P3). The number of communication actions is variable from one student to another thus revealing a form of commitment to each specific interaction. This more or less activity changes the visibility of each and likely contributes to change the sense of presence (Jacquinot-Delaunay, 2001) of each other in the group.

The content analysis of messages in three phases of collaborative work shows a strong variation on the present socio-effective elements, present in 70% of messages early in the session and then declined consistently (Figure 1).

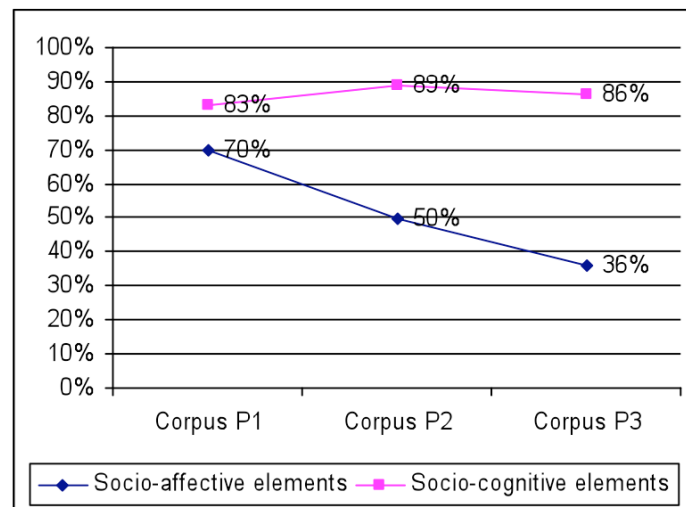


Figure 1. Evolution of the message content

The units of meaning to socio-cognitive connotations are found in 83% of messages in corpus P1 with a small growing change in P2 and P3. This high rate of socio-cognitive elements during the whole session is to be directly linked to notions of collaborative work and on line learning. Indeed, the task to be performed, which is at a more distance, requires multiple interactions in terms of building knowledge and methodological organization. The socio-emotional elements, present in very early discourse, probably constitute unity in the working group.

These exchanges, which fall faster trademarks of familiarity, contribute to group cohesion, the formation of the team and thereby facilitating the conduct of the task. This interpretation is however to be considered with caution since the posted messages are only visible actions on the forum. However, there are interactions that take place outside of dedicated space to group of students for which we have no precise data.

In further observation, we obtain a distribution of units of meaning to socio-cognitive characteristics in the messages (Figure 2). Exchanges showing meaning of units concerning the organization of collaborative work are the most representative and remain almost constant during the module. This situation seems to have attributes conducive to the attainment of socio-cognitive conflict in nature (Perret-Clermont, 1986).

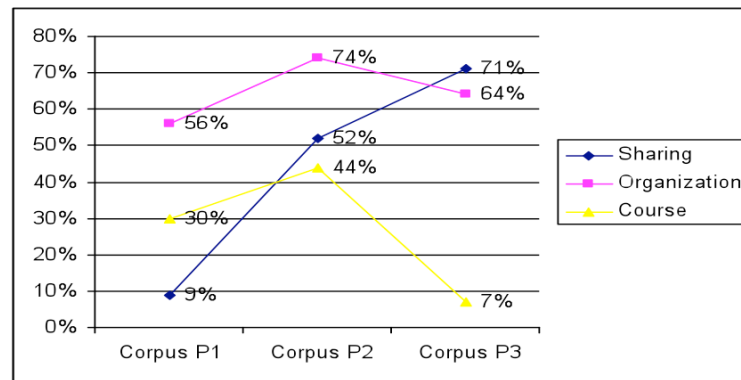


Figure 2. Characters contained in socio-cognitive

DISCUSSION

The digitized traces of the actions of six students confirm the richness and the appearance of highly structured interactions. The content analysis of messages highlighted the significant number of references to areas other than the forums. Different sites of interaction were proposed by the university early in the session. They were then produced in the course module at the initiative of some students. As part of an online collaborative work, students were engaged in conducting a joint project since it was a matter of collective production with a specific deadline. Also in the case studies, there was a strong challenge since part of the collaborative work led to products involved in the final evaluation. Hence we can consider that there must be a relationship of interdependence between group members. Each team member has the respect of the order of interaction by its partners. They are linked by a common sense and a form of intimacy was established in the team. This approach allows the micro sociology to pay attention to what is playing at a small social unit in the specific context of online collaborative learning (Nizet & Rigaux, 2005; Winkin, 2001). We are in the field of human communication and thematic analysis verifies the presence of strong socio-emotional and socio-cognitive factors.

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