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Structure and content of messages in an online environment: An approach from participation

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ABSTRACT

This study examines the participation of 24 university professors in the training process that uses on-line environment, which has a duration of 36 h in classroom and 30 h online. The main aim of the course is to provide theoretical and methodological elements that allow teachers to investigate and innovate in their educational practice. With this purpose, the messages were analysed regarding their nature, information level, depth level, and the relation between each of the indicators. The data corpus corresponds to ten discussion forums which were part of a training program in research and innovation in university teaching. The methodology used for the analysis considered the combination of quantitative indicators of participation with an analysis of message content. The results show that the messages are organized mainly around the content or learning task, which in turn tend to concentrate on levels with less complexity and depth. The data also indicate that there is a relation between message length, information level, and depth level achieved by the contributions of the participants when they collaborate in an online environment.

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1. Introduction

The sustained growth of the use of computer-mediated collaborative environments and the different devices used in educational contexts, particularly in higher education («Class Differences», 2012; Yang, 2014), make it increasingly necessary to understand how these formative processes are configured and organised in different use contexts (Lockhorst, Admiraal, & Pilot, 2010). This study analyses a training process of 24 university teachers with the support of a virtual environment. The course entitled “Research and innovation in university teaching”, belongs to a diploma in research and innovation designed to enhance the work of university teachers facing the new educational scenarios in higher education, through the facilitation of theoretical and methodological elements that allow them to investigate and innovate in their educational practice. To meet this goal, the course was facilitated through a collaborative learning environment and organized in thematic forums.

There is agreement that the use of computer-mediated

collaborative environments favours a number of characteristics which can contribute considerably to learning, such as information transfer, exchange and development of ideas, exploration of shared resources, and collaboration in the construction of knowledge (Chiang, Yang, & Hwang, 2014; Lameris, Levy, Paraskakis, & Webber, 2011). All of these characteristics can be considered of special relevance to learning and may be favoured by using online support tools (Choitz & Lee, 2006; Coll, Rochera, & de Gispert, 2014).

However, it is widely shared that the use of these learning spaces by the participants determines largely the potentialities they can achieve (Kupczynski, Gibson, Ice, Richardson, & Challoo, 2011). In this sense, participation is the basis for generating efficient interactions in the learning processes (Hrastinski, 2009; Tseng & Kuo, 2014; Vonderwell & Zachariah, 2005). In spite of the above, participation is no guarantee of learning but is, rather, a condition; thus, it becomes necessary to explore the configuration taken by the messages in discussion forums.

The study of participation in Computer-Supported Collaborative Learning (CSCL) considers aspects as diverse as the number and distribution of the participants' messages, the length of the messages, or the permanence time in the environment, to mention the most important ones (Hong & Scardamalia, 2014; Hrastinski, 2008;

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Lipponen, Rahikainen, Lallimo, & Hakkarainen, 2003). However, these indicators by themselves are insufficient for studying the learning processes (Meijer, Oolbekkink, Meirink, & Lockhorst, 2013). The above makes it necessary to incorporate the study of the content of the messages (De Wever, Schellens, Valcke, & Van Keer, 2006; Hong & Scardamalia, 2014).

The relation between some structural indicators of activity and the content allows more direct access to the construction of knowledge made by the participants as they collaborate in a learning activity (Coll, Engel, & Bustos, 2009; Shaw, 2013).

In the same sense, different authors support the thesis that the type of participation developed in online forums is closely related to the depth achieved by the messages in those forums (Dillenbourg, Järvelä, & Fischer, 2009; Hrastinski, 2008; Lipponen et al., 2003). In spite of the above, the type of participation, associated with structural indicators of activity, is not necessarily related to the depth reached by those contributions (Hara, Bonk, & Angeli, 2000; Martinez, Dimitriadis, Rubia, Gómez, & de la Fuente, 2003; Remesal & Colomina, 2013).

In brief, the study presented here has the purpose of determining the relation between the nature of the messages in an online environment, the level of information, its depth level, and the relation between each of these factors.

2. Analysis of the participation

One of the main objectives of the present work is to report on the quality of the communicative exchanges during the collaboration process in CSCL environments (Lockhorst, 2004). Various authors note that to complete a task successfully, the group members must participate in different types of activities that bring on mainly a series of communicative exchanges during the collaboration process (Erkens, Jaspers, Prangma, & Kanselaar, 2005; Janssen, Erkens, & Kirschner, 2011; Kreijns, 2004; Van Leeuwen, Janssen, Erkens, & Brekelmans, 2014). In this context, the exchanges are only possible insofar as there is active participation during the collaboration process.

The participation can refer to different aspects: on the one hand, to those related to the individual or group activity developed by the participants in these environments, which in turn is translated into structural activity indicators (Dimitracopoulou, 2008; Ocepek, Bosnić, Nančovska Šerbec, & Rugelj, 2013), such as, for example, the number of contributions, the length of the messages, and the number of replies, among the most important (Lipponen et al., 2003). On the other hand, the participation may refer to the content of the discussion, i.e., to the communicative exchanges generated in these platforms (De Wever et al., 2006; Lee, 2013).

It should be noted that in view of the impossibility to consider, in the measurement of the participation, all of the actions carried out by a participant in an online learning environment, it is necessary to distinguish indicators whose purpose is to provide a measurement of participation that represents the collaborative activity as extensively as possible (Coll et al., 2009; Hrastinski, 2008). However, the indicators reviewed so far only allow a first approach to the collaborative activity and require the relation with the content of the messages or their depth level (Lee, 2013; Lockhorst, 2004).

Our work considers the analysis of the length of the messages as the main structural measurement. The idea behind this indicator is that participation is equalized with writing, i.e., that students who write more should have a more active participation than students who do not. Examples of this indicator are given by various authors (Lipponen et al., 2003; Romero, López, Luna, & Ventura, 2013). Similarly, the work of Hara et al. (2000) also supports this measurement. They refer to long messages as a sign of the depth of the

students' interaction.

Another variant of the use of the length of messages is the proportion of the volume, i.e., the amount of text produced by a student compared to the total body of text (Hou & Wu, 2011). Another way of measuring this indicator is to use only contributions identified as productive and deep instead of using the number of words of all of the messages.

With respect to aspects of content, they are related to the depth of the messages or to the level of complexity of the communicative exchanges throughout the collaborative activity (De Wever et al., 2006; Kwon, Liu, & Johnson, 2014). These exchanges reveal different dimensions of the activity in which the participants collaborate. These dimensions are dealt with by different authors who, in general terms, note four important patterns that must be considered in the communicative exchanges in virtual environments (Janssen et al., 2011).

The first pattern corresponds to the most frequent type of exchange in online discussion forums, i.e., those communicative exchanges that are related specifically with the learning task and whose purpose is to put information resources in common among all of the group members, verbalize ideas and opinions, or ask questions to obtain important information (Kam & Katerattanakul, 2014).

The second pattern, in turn, is associated with the support or social order relations that are essential when students produce some type of product, such as a task in collaboration with their partners. Feeling supported to carry out communicative exchanges is important (Haythornthwaite, 2002). Therefore, group members must take care of the social and emotional aspects of collaboration during a group task (Kwon et al., 2014).

The third pattern includes the coordination or regulation of the activities related to the task (Erkens et al., 2005), which implies coordinating an adequate order and time without conflicting with the activities of other students (Chiang et al., 2014; Gutwin & Greenberg, 2004). The idea behind this proposal is based on the need to coordinate the actions that regulate the execution of tasks, such as the preparation of work plans, control of the partners' progress, and aspects considered important for the successful performance of the group (Kwon et al., 2014; Van Meter & Stevens, 2000).

The fourth pattern, which is the same as the activities related to the task, requires the collaboration of the coordination or regulation of social activities (Kreijns & Kirschner, 2004; Kwon et al., 2014). In the collaboration process, the members of a group are interdependent and must therefore talk about collaboration strategies associated with formulas which allow for controlling, evaluating, and reflecting on the way in which they collaborate. For example, according to Kwon et al. (2014), it is well known that when members of a group discuss how their group is carrying out its collaboration or how the collaboration can be improved, the group's performance increases.

The participation patterns mentioned above can be considered to be of special importance in a collaborative learning process in these contexts, but different reports note that communicative exchanges in CSCL environments tend to concentrate on the required types of learning or tasks (Coll et al., 2014; Guzdial & Turns, 2000) rather than on other types of exchanges. The same authors mention that social exchange is not very valuable for academic learning but may be useful for achieving important learning functions, such as activation of the participation of discourse, increased motivation, or the construction of a community (Coll et al., 2014; Kreijns, 2004).

In short, it is of special interest to analyse the different types of communicative exchanges in these environments and their relation with the way in which group members participate. In this context, the study of the type of communicative exchange and the depth of

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