

## Chapter 3

# Understanding Online Discourse Strategies for Knowledge Building Through Social Network Analysis

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### ABSTRACT

*Assessing the development of students' knowledge building discourse is difficult. It would be beneficial to have clear indicators of such discourse to understand if and how it is developing. The aim of this research is to identify indicators that can monitor how the knowledge building process develops during online discussions. In particular, we analyzed university students' discourse in an online setting oriented to knowledge building. An innovative mixed-method analysis approach was used. First, a qualitative content analysis was conducted to detect students' discussion strategies; second, an innovative version of Social Network Analysis (SNA), called Strategy Network Analysis was applied to analyze the relations among discursive strategies and to identify the most typical ones. Results showed that the most often used strategies in the knowledge process were "developing hypothesis" and "asking questions or problems of investigation." These were also the most effective strategies together with "expressing agreement or disagreement."*

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## **INTRODUCTION**

Educational theories assign a crucial role to peer interaction as an important source of learning. By talking to each other, students can engage in non-conformist and non-rhetorical argumentation, genuine questioning and answering, and be very motivated to participate in discussion (Blumenfeld, Marx, Soloway, & Krajcik, 1996). Nevertheless, understanding whether a discussion is proceeding in a productive direction is very complex even for experienced researchers and teachers. Students would benefit from real-time feedback and scaffolding to optimize their learning through discourse. Online environments such as web forums may offer benefits of written communication by supporting student reflection on the contribution to the discussion before making it public. This could improve the metacognitive skills of the students, but it does not help us understand when a discussion is fulfilling its instructional goals. Web forums automatically record the discussions, offering the possibility to read and re-read the entries. This may facilitate the task of assessing the quality of discussions, because it can be analyzed post hoc, but usually not while the discussion is taking place. Thus, conceptual and methodological tools are needed to understand when the discussion is actually moving toward the desired direction in situ. This task is particularly important when students' discussion is considered the vehicle of learning, as in theories such as Knowledge Building (Scardamalia & Bereiter, 2003).

## **THEORETICAL BACKGROUND**

Knowledge Building (KB) theory, pedagogy, and technology are attempts to reform education in a fundamental way to enculturate students into a knowledge creating culture (Scardamalia & Bereiter, 2006). Knowledge Building is a socio-constructivist framework defined as “the produc-

tion and continual improvement of valuable ideas for a community” (Bereiter & Scardamalia, 2003, p. 1370).

According to KB, ideas are considered as real objects of inquiry and improvement (Scardamalia, 2002). This means that ideas can be revised, discussed, interconnected, corrected, and if necessary, replaced. This way of handling ideas represents a challenge to educate people to develop the capacity to create and innovate upon the knowledge of the community through the creation of new theories. Each contribution to the community is useful for creating a shared understanding and for giving ideas a life that goes beyond the transitory nature of the conversation. The developments in understanding a phenomenon or a theory produce conceptual artifacts that serve, in turn, to achieve further individual progress in a dynamic virtuous circle. This process will lead people to the advancement not only of their personal knowledge but also of the collective knowledge.

From this perspective, the difference between learning and KB becomes crucial. Learning is an internal psychological process that is not directly observable, results in lasting change of beliefs, attitudes and skills, and occurs as a result of experience; in contrast, KB is the result of the creation or modification of knowledge that depends on the active and collaborative participation in discussion, sharing, negotiation and integration of ideas (Bereiter & Scardamalia, 2003). Thus, in KB students should not only pursue a good individual performance, but also they should build and improve ideas that will be available and useful to the community. Individual learning is, however, functional for the advancement of knowledge in a community and, at the same time, it is a direct consequence of such advancement.

To guide the KB process, Scardamalia (2002) proposes a set of twelve principles or “socio-cognitive determinants of Knowledge Building” (p. 9) that act jointly with each other. The starting point of the KB process is the effort to understand

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