Chapter 13

Methods for Analyzing Computer-Mediated Communication in Educational Sciences

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ABSTRACT

Computer-Mediated Communication (CMC) is the process by which individuals can exchange information, communicate with each other in multiple ways, and socially construct knowledge by means of networked information and communication technologies (Gunawardana et al., 1997). CMC tools record transcripts of messages and interactions and provide researchers with a “ready-made” source of data. Today, researchers are seeking for alternative theories, methods, and software tools in order to better investigate CMC and its effect on different learning outcomes (Garrison, 2000). In order to understand the learning process in CMC, content analysis, and sequential analysis (interaction analysis), Jeong (2005) offers a methodological framework to explore the discussion process, product, and quality. Therefore, in this chapter, the authors aim to provide guidance for scholars and practitioners by referring to the basics of the two complementary methods (content analysis and sequential analysis), pitfalls, challenges, as well as strategies and implications of the methods.

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A BRIEF INTRODUCTION TO CMC

Advances in information and communication technologies have been transforming education and research. Computer-Mediated Communication (CMC) tools are emerging as a promising means of enhancing constructivist learning environments and have become ubiquitous in teaching, learning and research praxis. CMC facilitates rich multi-way communication opportunities either synchronously (communication occurs in real-time) or asynchronously (communication occurs at different times); provides tools for knowledge sharing such as discussion forums; and promotes social knowledge construction (Bodzin & Park, 2000). In this study, CMC refers to the process by which individuals can exchange information, communicate with each other in multiple ways and socially construct knowledge by means of networked information and communication technologies (Gunawardana et al., 1997).

In the last four decades, there has been an accelerating trend in using these technologies for both instructional and research purposes. This in turn demands new knowledge and strategies to use CMC effectively and overcome the pitfalls. Therefore, in this study, we firstly presented fundamental and practical information about two complementary methodologies (content analysis and sequential analysis) used in CMC and then elaborated upon these emergent trends with a case study and by discussing the implications for practitioners. We aimed to provide guidance for scholars and practitioners by referring to the basics of the two complementary methods, pitfalls, challenges as well as strategies and implication of the methodologies.

An Overview of the Methods Used in CMC

In fact, interest in investigating human communication patterns is not new. Researchers have long been studying written and oral communication and these studies have produced considerable expertise in research methods such as discourse analysis. However, CMC has unique characteristics which bring it into the focus of interest of a growing number of researchers in the field (Naidu & Jarvela, 2006). For instance, CMC has its distinctive dynamics which are different from face-to-face communication, and data sources produced on CMC require a different perspective to conduct analysis. To make it more concrete, CMC contains multi-media materials, dynamic texts, a variety of communication styles (e.g. a/synchronous communications, using emoticons, etc.) and therefore contains particular interaction patterns and communication tools which form the data content and sources. Thus, CMC researchers have adopted different methods in order to understand qualities of interaction and learning.

Depending on ontology, epistemology, and purpose of the researchers, broadly speaking, methods used in CMC could be stated as Social Network Analysis (SNA), Content Analysis (CA), Sequential Analysis (SA) and survey data analysis. SNA deals with how actors and social entities interact with each other (Galaskiewicz & Wasserman, 1994) and how these interactions can be construed structurally, socially, and culturally. In SNA, social relationships are viewed from nodes (actors in network) and ties (relationships). However, it is important to note that in order to adopt SNA, the number of research participants is important, as it may not be applicable to use SNA in small groups. Web/online surveys are conducted through a set of pre-defined, open-ended or structured questions which could be delivered either on Websites or online communication tools (e.g. emails). Online surveys are relatively easier to spread among potential participants, and it is easier to collect and analyse the data, compared to other methods. However, as a methodological limitation, possibly due to the unwillingness or unavailability of the individuals, non-response rates challenge the quality of online surveys (Crawford et al., 2001; Dommeyer & Moriarty, 2000; Kalogeraki, 2011) and this constraints the data analysis process.