An Analysis of the Structure and Evolution of the Distance Education Research Area Community in Terms of Coauthorships

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ABSTRACT

This article aims at characterizing the research community of Distance Education (DE) with respect to coauthorship, a special kind of collaboration among researchers, according to publications of 11 relevant DE journals. This article identified who the central researchers are, the topological properties of the coauthorship networks analyzed, the coauthorship patterns of each journal and the evolution of the DE community in the last 30 years. In order to achieve these goals, Social Network Analysis (SNA) was used, deriving centrality metrics, which depict the importance of researchers in the networks. This study found out that researchers who publish more papers are not necessarily the ones considered more central according to SNA. Besides, promising researchers, those linked to central researchers and are considered more likely to coauthor papers in the near future. Different coauthorship patterns among journals are described. Finally, a steep increase in the number of publications and coauthorships in the last decades was observed.

KEYWORDS
Coauthorship, Distance Education, Online Learning, Research Communities, Social Network Analysis

INTRODUCTION

Distance Education (DE) is subjected to continuous changes due to advances in technology and learning sciences. Such fact opens the field up to research areas in very short time periods. Besides DE uses concepts, models and theories of other fields, such as engineering, computer science, communication, management, sociology and psychology (Bozkurt et al., 2015). Therefore, it could be implied that DE researchers need to work together with researchers from other areas, increasing the number of coauthored studies.

Collaboration is intrinsic to a network of researchers. A series of forms of collaboration have been identified, including co-citation and coauthorship (Hu & Racherla, 2010; Ye, Li, & Law, 2011), which are often used in papers that study research communities. The analysis of citation counts is one of the most popular methods of research assessment, however, it does not capture the social aspects that support and transmit scientific ideas neither how network communities are assembled. In turn, the analysis of coauthorship of articles enables the construction of observable and visual measures of a research field community. Therefore, coauthorship analysis identifies who the important scientists are (Hu & Racherla, 2010). Moreover, the growing importance placed upon research publications in academia, together with significant advances in communication technologies have led to an increase in coauthorship in different areas, such as operations management, economy, tourism and human sciences.
resources management (Barbosa, Ladeira, & Vicente, 2017; Behara, Sunil, & Smart, 2014; Cainelli, Maggioni, Uberti, & Felice, 2015; Fischbach, Putzke, & Schoder, 2011; Henneberg, Swart, Naudé, Jiang, & Mouzas, 2009).

Collaborations through coauthorship form a “coauthorship network” in which the network nodes represent authors and a connection between two authors exists if they have coauthored a study. Such network of collaborations is a type of social network, which can be defined as a set of individuals or groups (called nodes or actors) each of which has some kind of connections to some or all of the others. The study of these networks, their participants and the interactions among them is called Social Network Analysis (SNA), which is an approach that handles the relation tie between social actors, and can be analyzed as individual or collective units (Wasserman & Faust, 1994). SNA has become one of the most popular interdisciplinary analysis techniques (Ye et al., 2011). As so, SNA is considered an appropriate research method to study the DE research community, due to its interdisciplinary characteristics and applications.

Although some studies characterizing DE research using SNA were found (da Silva et al., 2014; Zawacki-Richter & Anderson, 2011), none of them have analyzed the research community through coauthorship lenses. In this way, the objective of this study is to characterize the research community of DE in terms of its network of researchers. More specifically, this work is interested in answering the following research questions (RQ):

- **RQ1**: Who are the most influential researchers in the Distance Education field in terms of number of publications and collaborations?
- **RQ2**: What are the macro and micro topological properties of the coauthorship networks derived from this study?
- **RQ3**: Do different DE journals present similar patterns in terms of coauthorship?
- **RQ4**: How has the research community evolved in terms of coauthorship in the last decades?

This paper contributes to the DE literature in different ways. First, it identifies who the most central actors in this area are. Second, it analyzes coauthorships in 11 relevant journals in the area. Third, it describes the evolution of this research area in terms of coauthorships. We are not aware of any previous work that has done so until now. Comprehending the structure of the coauthorship networks in a research field is important to better understand how researchers interact and also to develop new partnerships with important individuals in the area.

The remaining sections of this article are organized as follows. Section 2 provides the theoretical background of this work, focusing more specifically on the understanding of SNA and its corresponding metrics. Section 3 describes the research methodology used and Section 4 presents the results found by our analysis. Finally, Section 5 presents our conclusions, research limitations and suggestions for further studies on the subject.

**SOCIAL NETWORK ANALYSIS**

Individuals and organizations participate in various different forms of interaction among them. In order to study such interactions, networks may be used to model and graphically represent these interactions and actors that participate in them. SNA is the analysis of a set of relations among actors engaged in different relationships such as mentor/advisee, colleague, and co-author (Marion et al., 2003).

One of the most important uses of SNA is the identification of those actors that are most central within the network. Centrality is a structural attribute of the relations among actors in a network rather than an attribute of the actors themselves (Carter, Ellram, & Tate, 2007). Centrality in a social network is a concept that illustrates the most important and prominent actors in the network. Actors with high centrality possess a strategic location within the network (Giannakis, 2012). Actors who
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