Social complex and Semantic networks based on keywords from Brazilian physics teaching between the years 1972 and 2006

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Metrics of social and complex networks can be used in the study of emergent patterns in semantic networks. A semantic network is a form of knowledge representation based on graphs, where each word is represented by a vertex and the relations between the words are the edges of the network. The present article aims to investigate the use of keywords as auxiliary elements for the identification of the main themes of dissertations and theses in the area of physics teaching in Brazil between the years 1972 and 2006. The realization of the present study is founded on graph theory and network theory. We calculate the indices used on complex networks (Number of vertices, Number of edges, Average degree, Density, The clustering coefficient of a vertex *V,* Average clustering coefficient, The average minimal path length or geodesic distance and Diameter) and the degree centrality used on social networks. Our results suggest that the network is small–world and scale free. We characterize the network topologically and verify the implications of the computational model for the main context of the data source, which is physics teaching in Brazil. In addition, using the proposed method, we verified that most of the topics emphasized in the network are related to the education of physics teacher and not to methods of teaching physics at different levels.