



Characteristics of Brazilian scientific research on diffusion of innovations in business administration

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Abstract

The aim of this paper is to analyze the characteristics of Brazilian scientific research in diffusion of innovations in administration. A bibliometric research was conducted with network analysis in scientific papers about diffusion of innovations in Spell database. The papers were analyzed from descriptive, bibliographic, methodologic, results and citation characteristics. The authors concluded that Brazilian publications are coherent with the international research considering the adoption of diffusion of innovations frameworks. Still, it has a trait of considering government support in diffusion frameworks, an absent parameter in the original frameworks; therefore, representing a development potential for diffusion of innovations researchers in Brazil.

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Keywords: International innovation; Diffusion of innovations; Brazilian scientific production

Introduction

Diffusion of innovations has been studied since the end of the forties, but from the sixties, with Rogers (2003) and Bass (1969) researches, it was spread. Considering the technological development in the last decades, innovation diffusion frameworks have been updated to approach the phenomena in a more complex way. However, it is possible to note parameters suggested by Bass (1969) that remain relevant in contemporary frameworks, such as the influence of communication.

Due to the comprehensiveness of diffusion of innovations subject, two main approaches are found in the literature: communication and administration. According to Peres, Muller, and Mahajan (2010), little is known about the history of the scientific

research in diffusion of innovations in administration, mainly in the Brazilian research.

Due to the development of international research in the subject and the lack of knowledge about Brazilian research, the aim of the paper is to analyze the characteristics of Brazilian scientific research in diffusion of innovations in administration. To do so, a bibliometric research was conducted in Spell database searching the terms “*difusão de inovação*” and “*difusão de inovações*” in the abstracts. After the exclusion criteria, 30 papers were analyzed.

The papers were analyzed according to descriptive (year of publication, authors and journals), bibliographic (diffusion framework) and methodologic (research method) characteristics; besides their results (parameters suggested) and citations. They were also categorized in research trends described by Peres et al. (2010) to compare the Brazilian sample and the international research.

The paper is relevant due to the comparison between Brazilian and international research and the identification of exploitable Brazilian specificities to maximize the scientific research in administration.

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Literature review

The diffusion of innovations research field has several approaches and paradigms developed in the last decades. The most comprehensive and widespread definition is in Rogers (2003, p. 5), presented as “the process by which an innovation is communicated through certain channels over time among the members of a social system”.

The research on diffusion of innovations in administration comprehends the analysis of three main perspectives: sociology, social psychology and technology (Van de Wijn-gaert & Bouwman, 2011). Each perspective is divided in different research fields according to the analysis scope and parameters. Despite the perspectives not being directly related to administration, the frameworks have been used as references to understand the diffusion of innovations in administration.

Diffusion of innovations in sociology

The diffusion of innovations concept in sociology comprises two fields: Innovation Diffusion Theory and Perceived Characteristics of Innovating.

The *Innovation Diffusion Theory (IDT)* is divided in three main frameworks: Bass, Moore and Roger. Bass (1969) proposed a mathematical model to describe the process of diffusion of innovations. It presents five innovation adoption categories and two main communication channels: mass media and “word-of-mouth” (Martinez, Polo, & Flavian, 1998).

G.A. Moore (1995) used Bass as basis, but presented the discontinuity process in the diffusion of innovations, focusing in organizations and their needs of technological innovation. However, Rogers (2003) has a wider impact in the scientific research, also using the five categories proposed by Ryan and Gross (1943), but adding other parameters to the framework.

The *Perceived Characteristics of Innovating (PCI)* framework, published by G.C. Moore and Benbasat (1991), develops on Rogers’ framework with a specific focus. It complements the perceived characteristics of innovations, persuasion components and adoption rates drivers. It may be considered an IDT complement, reorganizing its parameters and inserting aspects such as Voluntariness. The interaction between IDT and PCI is pictured in Fig. 1.

Diffusion of innovations in social psychology

In the social psychology approach, two research fields are used as complements to the diffusion of innovations research. They are focused on understanding human behavior regarding innovations: Theory of the Reasoned Action and Theory of Planned Behavior.

The *Theory of the Reasoned Action (TRA)*, presented by Ajzen and Fishbein (1980), assumes that the human being is rational and decisions are made according to the information provided regarding the phenomena. Besides the rationality, it assumes that each person has full control over the decision-making process. Therefore, the human behavior is influenced

by the behavior intent (or the adoption of an innovation). Such intent is influenced by two aspects: attitude and subjective norm.

The *Theory of Planned Behavior (TPB)* does not present a new framework, but refines TRA. Ajzen (1991) recognizes the importance of TRA to foresee human behavior, but highlights its limitation to situations when the person has full control over the decisions made. Therefore, the authors propose TPB, focusing on human behavior when the person has partial control over the decision-making process, mainly in Attitudes and Behavior parameters. Both theories are pictured in Fig. 2.

Diffusion of innovations in information technology

Theories and frameworks on technology acceptance have been used to understand the diffusion of innovations. Technology Acceptance Model (Davis, 1989) and Unified Theory of Acceptance and Use of Technology (Venkatesh, Morris, Davis, & Davis, 2003) are examples of such frameworks.

Both framework approach the technology acceptance process, presented by Venkatesh et al. (2003) and formed by: (i) individual reaction on information technology usage; (ii) information technology usage intent; and (iii) information technology usage.

The Technology Acceptance Model (TAM), presented by Davis (1989), focuses on foreseeing a technology adoption in a group or company, especially regarding how a technological innovation may increase productivity. The authors are based on TRA to create the framework with two main parameters: perceived ease of use and perceived usefulness.

11 years after the publication of TAM, Venkatesh and Davis (2000) updated the framework with detailed external parameters that influence both main parameters of the previous one; naming it *The Extension of the Technology Acceptance Model (TAM2)*.

TAM and TAM2 may be used to analyze the information technology adoption process from a personal or organizational point of view, but Venkatesh and Bala (2008) considered there was a gap to be filled. They presented the *Technology Acceptance Model 3 (TAM3)*, focusing on how corporate managers decide on adopting new technologies to enhance productivity. The three frameworks are described in Fig. 3.

The *Unified Theory of Acceptance and Use of Technology (UTAUT)*, created by Venkatesh et al. (2003), focuses on analyzing organizational environments as a tool, comprehending eight previous frameworks in four parameters: performance expectancy, effort expectancy, social influence and facilitating conditions.

Such as in TAM2 and TAM3, Venkatesh, Thong, and Xu (2012) identified a gap from the customers point of view. Therefore, created the *Extended Unified Theory of Acceptance and Use of Technology (UTAUT2)* that preserves the parameters from UTAUT and includes parameters regarding the understanding of customers’ environment and point of view. The interactions between both versions are described in Fig. 4.

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