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E-Services In The E-Government: Bibliometric Analysis Of International Articles

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ABSTRACT

In the present study, the objective was to analyze the production and the publications profile of the theme: e-services tools referring to eGovernment in the Scopus database, for the period as from 2001 through 2015. The electronic government includes tools for the government's relationship with society, citizens, other governments and businesses. The focus of these articles includes e-services and e-Government activities for the businesses. It was used descriptive research, conducted through literature review, with bibliometric approach and quantitative analysis, with sample collected in the Scopus database. It was found that the number of works in this period was 299, of which 45 papers published in events in 2010 and 16 articles published in journals in 2013. The core point of the articles with the highest citation is related to the deployment and the users' awareness on tools established by countries.

KEY-WORDS: Electronic Government. E-services. E-government. Bibliometrics.

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E-Serviços no Governo Eletrônico: Análise Bibliométrica de Artigos Internacionais

RESUMO

Neste estudo, o objetivo foi analisar a produção e o perfil das publicações do tema ferramentas de e-Serviços referente a governo eletrônico na base de dados Scopus, no período de 2001 a 2015. O governo eletrônico compreende ferramentas para relação do governo com a sociedade, cidadãos, outros governos e negócio. O foco desses artigos compreende e-serviços e atividades de governo eletrônico para os negócios. Foi utilizada pesquisa descritiva, conduzida por meio de levantamento bibliográfico, com abordagem bibliométrica e análise quantitativa, com amostra coletada na base de dados Scopus. Concluiu-se que o número de trabalhos nesse período foi de 299, sendo 45 trabalhos publicados em eventos em 2010 e 16 artigos publicados em revistas em 2013. O ponto central dos artigos com maior citação está relacionado à implantação e à percepção de usuários de ferramentas implantadas por países.

PALAVRAS-CHAVE: Governo Eletrônico. E-Serviços. E-Governo. Bibliometria.

1 INTRODUCTION

The constant changes related to the new information and communication technologies (ICT) affect society at large and directly, as well as the governments in their decision-making processes. In view of this scenario, governments' leaders from different countries are either implementing or getting ready to use these tools in building more democratic governments, aiming at strengthening the relationship of the public sector with the civil society.

The e-government idea emerges to meet this need, using the ICTs so as to achieve the objective of democratizing the governments and ensure that there is greater transparency and social control.

According to Diniz, Barbosa, Junqueira & Prado (2009), the use of ICTs is associated to the *Internet* use for provision of electronic services, and this technology can be used either by the governments as a strategy in its internal processes and in the improvement of services to the society, or by the citizens, or by legal entities. Accordingly, the *Internet* and the new information technologies use by the public administration as reform and modernization tool launched the term "eGovernment".

Also according to Chen, Chen, Huang & Chen (2006), the electronic government (e-government) was created to integrate government, companies and citizens through the information and communication technology.

However, it is important to highlight that the electronic government is not tied solely to the use of the ICTs because, according to Agune & Carlos (2005), electronic government, contrary to what the name may at first suggest, means much more than the intensification use of information technology by the public authorities; it should be regarded as a transition from one form of government heavily segmented, hierarchical and bureaucratic, to a more horizontal, collaborative, flexible and innovative form of government.

In this research, the goal is to analyze the production and the publications profile of the theme: e-services tools referring to the electronic government in the Scopus database, during the period 2001-2015.

For being a topic whose published articles have been increasing over the years, it is appropriate to analyze the production and the intellectual profile of publications regarding the e-services as electronic government tool used in companies over the period as from 2001 through 2015, for thus, find the practical applications in different situations and the impacts on both public and private organizations. It is also appropriate as a contribution to the theoretical consolidation of the electronic government field.

In the above context, the question is: what is the production and the intellectual profile of the articles publications at the Scopus database on the theme: e-services as electronic government tool used in the companies over the period as from 2001 through 2015?

The work is divided into five parts. The first part deals with the introduction, in which it is presented the proposed theme, the research objective and the problem. The second part deals with the theory that helps the understanding of the electronic government concepts and its practices. The third part describes the method to be used. In the fourth part, the research results are shown and, finally, the final considerations are presented.

2 THEORETICAL FRAMEWORK

2.1 ELECTRONIC GOVERNMENT

According to Zweers and Planqué (2001, p. 92),

> Electronic Government is an emerging concept which aims to provide or make available information, services or products, by electronic means, from or through government agencies at any time, place and citizen so as to add value to all *stakeholders* involved with the public sphere.

The electronic government or e-government is a concept that assimilates the ICTs potential in transforming the public administration, with substantial improvement of its organization, its services and the relationship

with society. This conception is inserted into an advanced perspective of democratic and transparent governance, open to the citizen participation (Knight, Fernandes & Cunha, 2007).

It is noticed that the concept becomes wider and requires greater effort from governments than just the use of technologies in their practices. The quality, the efficiency in providing service to society and the transparency of processes are highlighted, and the model spreads on a global scale. Cunha (2005) argues that broader concepts of e-government started to be considered, involving several topics: improvement of the public management processes, efficiency and effectiveness, better governance, drawing up and monitoring of public policies, service delivery and electronic democracy, the latter encompassing transparency, participation and *accountability*.

The electronic government study, according to Helbig, Gil-García and Ferro (2005) can be divided into three types of relationships:

- G2G (*Government to Government*), when it comes to be an intra or inter-government relationship;
- G2C (*Government to Citizen*), relationships between government and citizens - refer to the actions that the government carries out in order to make available to the citizen, through electronic means, services and relevant information to the public sphere;
- G2B (*Government to Business*), characterized by transactions between governments and suppliers or legal entities. Also known as e-services (*e-service*);

By creating information electronic channels and making available services to society, the electronic government emerges as an important public management tool that contributes for an even higher control and transparency.

When exposing the efforts undertaken in the world for the electronic government deployment, Silva and Lima (2007) state that there seems to

be a global understanding that this is the way to stimulate the relationship between government and citizen and to promote the electronic democracy.

According to Knight et al. (. 2007, p.492), the electronic government policy is guided by the following guidelines:

- provision of services and information to citizens;
- promoting people's access to the *Internet*;
- integration between information systems, networks, government databases;
- implementing of an advanced infrastructure of communications and services in the public administration;
- use of the purchasing power of the federal government aiming at the cost reduction.

According to Pessi (2007), the implementation of initiatives oriented to improve the relationship between government and citizens through the use of ICTs coexists permanently with the search for balance between, at least three factors, when the matter at hand is the provision of public services through electronics means. On one side are the priorities established by governments, according to their management needs. On the other side are the society expectation, which expects efficiency, agility and the obtaining of benefits. Finally, there remains the challenge of the distribution channel of services and electronic content in view of the inequalities in accessing the *Internet* and other devices necessary for a successful interaction.

Since 1990, it is noticed that governments at different levels, have started the launching of electronic government projects, for making available information and electronic services to the citizens and companies (Mello, 2009).

Whenever the society has access to the ICTs, it is possible for anyone to obtain information related to him/her and also related to others, which represents an enlargement of important channels in the developing countries, considering that it provides to their users almost unlimited access to the database of their interests (Mello, 2009).

With regard to the ICTs, their adoption allows to go beyond the passive information because it involves the active participation of citizens in the decision-making process (UNESCO, 2005).

Advancements in information and communication technologies have brought about implementation of new applications and the provision of high quality services through global networks; the purpose is to use this area of the information on society in order to improve the life quality of all citizens, increasing the knowledge, the social gains and maintaining the public entities updated in the electronic global scenario (Santhanamery & Ramayah, 2012).

Mello (2009, p. 39) comments that "with the ICTs arrival, the electronic governance appears as an emerging trend in order to reinvent the government functioning, particularly in the provision of public services and the citizen participation in the public management, using an online way".

Although strongly linked to the use of information technology in the public sector, the electronic government word is not limited to this element, in fact, it is linked to a comprehensive modernization in the public administration in the improvement of the efficiency of its operational and administrative processes, which represent the transition from one form of government segmented, hierarchical and bureaucratic to a more horizontal, collaborative, flexible and innovative government, more coherent with the knowledge society arrival (Agune & Carlos, 2005).

2.1.1 Electronic government in Brazil and worldwide

The global historical milestone for achieving the electronic government took place in August 1993 when there was the launching of the Mosaic, the first browser that allowed an easy web browsing. However, the movement was formalized on January 15, 1999, at the opening of the 1st Global Forum on Government Reinvention in Washington, attended by representatives from 45 countries, among them Brazil (Chahin, Cunha, Knight & Pinto , 2004).

According to Geron, Finatelli, Faria and Romeiro (2011), the e-government has been introduced as from the possibility of using the ICTs to support, modernize and improve public services.

According to Menezes (2012), in Brazil, the electronic government was set up through a decree by the then President Fernando Henrique Cardoso in 2000, when it was created an Inter-Ministerial Working Group to examine and propose policies, guidelines and rules relating to the new forms of electronic interaction.

Among the countries that have established legislation on the subject, are: Argentina, Chile, Mexico, Costa Rica, Colombia and Australia besides the European Union countries, due to the adoption of Directive 115/2001.

In 2001, Chile launched its Electronic Government strategy. Efforts around the deployment of this new system in the country have been recognized not only domestically, but also internationally. There are a number of international studies that place Chile in the first places regarding the e-government development worldwide (Sepúlveda, Vásquez & Gutierrez, 2006).

Chile was one of the first countries in Latin America to implement in its government, the electronic documents validation through a digital certificate. In March 2002, it was promulgated the Law no. 19,799 of this country, which deals with electronic documents, electronic signatures and companies services certification.

As well as Chile, Mexico was also one of the pioneers in developing the digital certification for electronic documents, in January 2002, through a decree. The aim was to regulate the certification through electronic identification, to be used in electronic transactions. Through this decree, the government authorizes properly regulated companies to issue the digital certification.

For Geron et al. (2011), the Brazilian government is also committed to improving its public services through ICTs through systems of relationship with taxpayers, as it begins a new age in computing that will be also part of the daily lives of businessmen, lawyers, accountants and other professionals.

Taking advantage of this evolution moment, in terms of management, the Brazilian government has used the experience of electronic governments of other countries as a model, such as Spain, Chile and Mexico, and has also entered the digital age, as mentioned by Britto (2008), with data transmission routines with digital signature, handling of electronic files, etc. Therefore, the Public Digital Bookkeeping System (SPED) has emerged, in order to approximate the tax authorities of the taxpayers (Brazil, 2009).

This system was established by the Brazilian government in 2007 and is part of the Growth Acceleration Program (PAC). According to Matos, Costa Pereira and Locks (2008), the SPED was born with the aim of promoting the integration of the monitoring and collection systems, standardizing the ancillary obligations for taxpayers and simultaneously making faster the identification of tax offenses.

2.1.2 E-government, e-services and e-democracy

In order to recognize and visualize on which ways the electronic management actions are demonstrated, it is important to segregate it into three major divisions: e-government, understood as the use of electronic means by the public administration; e-services, which represents the provision of services to the citizens and to the companies; and e-democracy, the use of electronic means in supporting the democratic practice.

> Addressing the first theme, e-government, it is about the digital support for the public policies development and implementation. Information technology helps not only the public policy implementation, the decision-making, but also the implementation and the results evaluation, in terms of the funds application, but mainly on the effectiveness of the policy implemented. Also, the technology can make the work of communication support, *workgroup*, and make possible the internal efficiency of processes - such as purchasing processes, travels of servers, human resources, revenues and expenditures control, government planning monitoring, and others. Also in e-government, it is possible to include the integration of public policies among the various government areas. Talking about e-government and transparency, in Brazil, an obvious example of results achieved was the Fiscal Responsibility Law (FRL), when it demanded that all government statements were published on the Internet (Cunha, 2005, p. 2).

On the electronic management division referred to as e-services, Ruelas and Arâmburo (2006) state that the growth and improvement of services are directly linked, in large part, to the multiple benefits that return to the government, citizens and companies, especially becoming the procedures more agile and effective, removing red tape and reducing costs in the transactions, transforming the funds productively through faster responses, coverage expansion and services quality. The result is a more assertive relationship among government, citizens and companies.

As exemplification of the e-services concept, Cunha (2005) mentions the call centers. With the support of technological resources and communication channels, these call centers are able to offer at the municipal, state or federal level easiness such as the highly qualified customer service to citizens and companies. Thus, anyone can have his/her request met, limited only to the cases where there is need for specialties such as the health services. An example of these call centers is called *PoupaTempo* in the state of São Paulo.

About the third division of electronic management, called e-democracy or electronic democracy, with the arrival of new information and communications technologies, it was possible to expand the discussions and the effectiveness of the society participation in public policy processes (Mezzaroba & Galindo, 2010).

Rezende, Frey e Betini (2006) points out that the use of democratic strategies of management and of information and communication technology by the most diverse democratic players (government, officially elected representatives, the media, political organizations, citizens) within the political processes and of communities' management characterizes the electronic democracy.

3 METHODOLOGY

The research is characterized as descriptive, conducted through bibliographic survey, with bibliometric approach and quantitative analysis. It is classified then as bibliographical, because it aims to analyze the production and the profile of the publications about the theme: e-services tools related to electronic government at the Scopus database - important international database (Vanz & Stumpf, 2010) with indexation of the leading journals of electronic government - for the period from 2001 up to 2015. The chosen period refers to the first publications on the theme e-services up to January 2015, the research final date.

According to Vanti (2002, p. 153), a bibliometric research

> "It is a set of research methods which uses quantitative analysis, statistics and data visualization, aiming to map the knowledge structure of a scientific field and serve as a tool for analyzing the researcher's behavior in the knowledge constructionf".

The sample studied here refers to the 299 articles presented under the theme "E-Services" available at the Scopus database from 2001 up to 2015. It was used as search criteria the temporal period; it was sought in the articles title the term *e-government*, limited by the keywords *e-government services*, *e-services* and *government services*.

In the process of data collection, after the articles selection, it was carried out, through spreadsheet Microsoft Excel, the data tabulation, in which the following items were highlighted: number of articles published from 2001 to 2015, identification of authors, authors' analysis, analysis of citations, and analysis of publications. It was used the features that were made available by the Scopus database.

4 PRESENTATION AND ANALYSIS OF RESULTS

First, it is presented the evolution of articles over the period 2001 up to 2015, separated by publications in journals and events. Then it is presented the distribution by country, study area, total of citations per author, most cited articles, total publications by journal and by events.

Table 1 presents the evolution of the number of articles by type of publication (journals or events) over the period 2001-2015.

Table 1: Evolution of the number of published articles

Year	Total Quantity	Journals	Events	%
2001	1	0	1	0,33%
2002	0	0	0	0,00%
2003	2	0	2	0,67%
2004	4	1	3	1,34%
2005	14	4	10	4,68%
2006	9	3	6	3,01%
2007	21	4	17	7,02%
2008	34	9	25	11,37%
2009	52	10	42	17,39%
2010	57	12	45	19,06%
2011	45	10	35	15,05%
2012	28	11	17	9,36%
2013	21	16	5	7,02%
2014	10	5	5	3,34%
2015	1	1	0	0,33%
Grand total	**299**	**86**	**213**	

Source: Research Data

It is possible to observe in Table 1, the largest number of publications in events, because it is a topic whose applications were started in the 1990s (Mello, 2009). From the total of 213 publications in events and 86 in periodicals, in 2010, it was presented the largest number of publications in events (45); in 2013, it was presented 16 articles in journals.

Table 2 presents the number of publications by the authors' country of origin. UK, USA and China have the highest indexes, 39, 34 and 30, respectively; Brazil presented three papers.

Table 2: Number of publications by country

Year	Total Quantity	Journals	Events	%
United Kingdom	39	14	25	11,47%
United States	34	13	21	10,00%
Greece	19	13	6	5,59%
Taiwan	11	6	5	3,24%
Spain	9	6	3	2,65%
Sweden	12	5	7	3,53%
Netherlands	8	5	3	2,35%
Australia	15	4	11	4,41%
Canada	4	4	0	1,18%
Germany	9	3	6	2,65%
Malaysia	10	3	7	2,94%
Italy	11	3	8	3,24%
France	7	2	5	2,06%
Iran	10	2	8	2,94%
Ireland	6	2	4	1,76%
Lithuania	7	2	5	2,06%
Romania	5	2	3	1,47%
Brazil	3	1	2	0,88%
China	31	1	30	9,12%
Others	90	15	75	26,47%
Grand Total	**340**	**106**	**234**	

Source: Research Data

Table 3 presents the areas of linking study of the events and journal. Computer Sciences presented the highest index (61.76%), followed by Business, Management and Accounting (43.82%).

Table 3: Study Areas

Year	Total Quantity	Journals	Events	%
Social Sciences	106	62	44	31,18%
Computer Sciences	210	61	149	61,76%
Business, Management and Accounting	149	19	130	43,82%
Decision Sciences	88	16	72	25,88%
Engineering	21	7	14	6,18%
Economics, Econometrics and Finance	8	4	4	2,35%
Psychology	4	4	0	1,18%
Arts and Humanities	3	3	0	0,88%
Mathematics	8	0	8	2,35%
Environmental Sciences	1	0	1	0,29%
Grand Total	**598**	**176**	**422**	

Source: Research Data

Table 4 presents the total of citations by authors. All the works were cited 1044 times, and the work of Hung, Chang and Yu was the most cited (158 times), followed by the work of Horst, Kuttschreuter and Guutteling (129 times).

Table 4: Authors x total citations

Authors	Total citations
Hung, S.-Y., Chang, C.-M., & Yu, T.-J.	158
Horst, M., Kuttschreuter, M., & Gutteling, J. M.	129
Tung, L. L., & Rieck, O.	105
Lean, O.K., Zailani, S., Ramayah, T., & Fernando, Y.	86
Weerakkody, V., & Dhillon, G.	61
Steyaert, J.C.	46
Ghapanchi, A., Albadvi, A., & Zarei, B.	30
Kamal, M. M., Weerakkody, V., & Jones, S.	23
van Velsen, L., van der Geest, T., ter Hedde, M., & Derks, W.	22
Panopoulou, E., Tambouris, E., & Tarabanis, K.	21
Lee, J., & Rao, H. R.	18
Apostolou, D., Mentzas, G., Stojanovic, L., Thoenssen, B., & Pariente Lobo, T.	17
Luk, S. C. Y.	17
Xiong, J. A.	15
Sipior, J. C., Ward, B. T., & Connolly, R.	14
Seng, W. M., Jackson, S., & Philip, G.	14
Hung, S.-Y., Chang, C.-M., & Kuo, S.-R.	13
Choudrie, J., Grey, S., & Tsitsianis, N.	12
Teerling, M. L., & Pieterson, W.	11
Others	232
Grand Total	**1044**

Source: Research Data

Table 5 presents the ten most cited papers published between 2004 and 2009. The publications *Government Information Quarterly* and *International Journal of Information Management* appear with two articles each, among the most cited.

Table 5: Most cited articles

Authors	Total citations	Title	Published in:	Year
Hung, S.-Y., Chang, C.-M., & Yu, T.-J.	158	Determinants of user acceptance of the e-government services: The case of online tax filing and payment system	*Government Information Quarterly*	2006
Horst, M., Kuttschreuter, M., & Gutteling, J.M.	129	Perceived usefulness, personal experiences, risk perception and trust as determinants of adoption of e-government services in The Netherlands	*Computers in Human Behavior*	2007
Tung, L. L., & Rieck, O.	105	Adoption of electronic government services among business organizations in Singapore	*Journal of Strategic Information Systems*	2005
Lean, O. K., Zailani, S., Ramayah, T., & Fernando, Y.	86	Factors influencing intention to use e-government services among citizens in Malaysia	*International Journal of Information Management*	2009
Weerakkody, V., & Dhillon, G.	61	Moving from e-government T-government: A study of process reengineering challenges in a UK local authority context	*International Journal of Electronic Government Research*	2008
Steyaert, J. C.	46	Measuring the performance of electronic government services	*Information and Management*	2004
Ghapanchi, A., Albadvi, A., & Zarei, B.	30	A framework for e-government planning and implementation	*Electronic Government*	2008
Kamal, M. M., Weerakkody, V., & Jones S.	23	The case of EAI in facilitating e-government services in a Welsh authority	*International Journal of Information Management*	2009
van Velsen, L., van der Geest, T., ter Hedde, M., & Derks, W.	22	Requirements engineering for e-government services: A citizen-centric approach and case study	*Government Information* Quarterly	2009
Panopoulou, E., Tambouris, E., & Tarabanis, K.	21	A framework for evaluating web sites of public authorities	Aslib Proceedings: New Information Perspectives	2008
Grand Total	**681**			

Source: Research Data

In the most cited article, Table 5, it was analyzed the users acceptance of the e-services tools implementation; in the second most cited article, it was found the perception of uses, risks and trust in this tool adoption. In these studies, it was analyzed specific cases of implementation in countries such as the Netherlands, Singapore, Malaysia, and the UK. Two papers presented theoretical milestone of implementation, planning and e-services evaluation.

Table 6 presents the journals by number of publications, being *Electronic Government*, *Government Information Quarterly* and *International Journal of Electronic Government Research* the main journals that have published on this theme.

Table 6: Number of publications by journal

Published in:	Grand Total
Electronic Government	10
Government Information Quarterly	9
International Journal of Electronic Government Research	9
International Journal of Information Management	5
Behaviour and Information Technology	3
International Journal of Electronic Governance	3
Transforming Government People Process and Policy	3
IFIP Advances in Information and Communication Technology	2
Decision Support Systems	2
International Journal of Applied Systemic Studies	2
Information and Management	2
Journal of Cases on Information Technology	2
Journal of Organizational and End User Computing	2
Telecommunications Policy	2
Transylvanian Review of Administrative Sciences	2
European Journal of Economics Finance and Administrative Sciences	1
European Journal of Information Systems	1
European Journal of Social Sciences	1
IEEE Technology and Society Magazine	1
Others	24
Grand Total	**86**

Source: Research Data

Table 7 presents the number of publication by events, being the *European Conference on e-Government - ECEG*, the main discussion moment of this theme, with 64 papers presented.

Table 7: Number of publications by events

Event	Quantity
European Conference on e-Government - ECEG	64
IFIP Advances in Information and Communication Technology	11
International Conference on Electronic Business - ICEB	9
Americas Conference on Information Systems - AMCIS	8
Americas Conference on Information Systems - AMCIS	8
Lecture Notes in Business Information Processing	7
2011 International Conference on E-Business and E-Government - ICEE	4
International Conference on Management and Service Science - MASS 2009	4
Innovation and Knowledge Management: A Global Competitive Advantage - Proceedings of the 16th International Business Information Management Association Conference - IBIMA 2011	3

International Conference on E-Business and E-Government - ICEE 2010	3
2010 IST-Africa	3
Proceedings of the European, Mediterranean and Middle Eastern Conference on Information Systems: Global Information Systems Challenges in Management - EMCIS 2010	3
2009 International Conference on Information Management, Innovation Management and Industrial Engineering - ICIII 2009	3
2008 3rd International Conference on Information and Communication Technologies: From Theory to Applications - ICTTA	3
2014 1st International Conference on e-Democracy and e-Government - ICEDEG 2014	2
Others	78
Grand Total	**213**

Source: Research Data

With this bibliometric study, it is possible to perceive the evolution in these 15 years of the electronic government works in the perspective of e-services: there was growing presentation in events from 2005 to 2011; and from 2009 to 2013, definitive publications in journals. Works with more than 100 citations were presented; United Kingdom, United States and China had authors with more production, and Brazil was present among the 19 countries with more than three publications.

5 CONCLUSION

In this work, the objective was to analyze the production and the profile of publications on the theme: e-services tools related to electronic government at the Scopus database, for the period from 2001 through 2015. For this analysis, it was carried out a bibliometric survey, based on descriptive and quantitative data, in which it was analyzed 299 articles published at the Scopus database.

In the electronic government theme the topic e-services is the point that is directly connected with the taxpayers activity, especially the companies with tools for controlling, calculation and accounting and tax supervision. With the encouragement of the United Nations, countries from all continents, of all stages of development, are deploying and organizing this government-businesses relationship.

It was concluded, when analyzing the results found, that the theme had an increase in publications in events until 2010, with 45 works, and in journals until 2013, with 16 works. It was also observed that in the early years, i.e. from 2001 to 2004, the publications related to the theme had a limited number and were concentrated on events, and only in 2002 there was no publication.

According to the accomplished survey it was found that Computer Science and Business, Management and Accounting are the main areas of these publications. As for the authors' geographical distribution, the highlights were the United Kingdom (UK), United States and China. Among the most cited works it stood out the studies that verified the deployment and adoption of the tools in countries.

As the study limitation it is emphasized the use of a single database. It is suggested for further works in relation to the investigated theme, to include other databases, thereby increasing the number of articles to be researched, the analysis of the methodologies and the theories used in the works.

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