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PANORAMA OF THE BELIEFS OF SELF-EFFICACYIN BASIC EDUCATION TEACHERS

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ABSTRACT

The present research has as objective to build a panorama of Brazilian researches about self-efficacy of teachers in Basic Education, considering the period from 2006 to 2016, in order to identify the findings referring this construct, and concomitantly identifying possible gaps. The research is characterized as a systematic review, in which the method consists on data analysis with a mixed approach (quanti-quali). The results obtained demonstrated that the beliefs of self-efficacy influence directly the teaching practice in Basic Education, as it is possible to identify it in several areas of the educational context. Besides that, the referred construct could be related to different categories related to the educational context, such as: satisfactions, burnout, among others. The most frequent categories appearing in the authors' investigations were general characteristics, identity and teaching practices, demonstrating that the belief of self-efficacy can be studied as one of the components of the process of construction of professional identity, being able to influence the teaching practice.

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INTRODUCTION

It is known that the school environment has some complex and potentially problematic situations, such as students' learning difficulties, inadequate physical and curricular structure of the school, low remuneration, among other factors. Besides that, the teacher also has to deal with demands required for Basic Education, as: to promote the integral development of the student in his physical, affective, psychological, intellectual and social aspects;to develop the capacity of learning dominating reading, writing and calculation; to make possible for the student to understand his natural and social environment, the political system, the economy, the technologies, arts, different cultures and the values that base the society, among others (BRASIL, 2010). However, even with such demands and this table of possible emerging difficulties in the context of teaching work, it is necessary for the teacher to be a proactive agent in order to face the demands required by the profession. It is considered that to develop positives beliefs in their capacities and abilities is an important factor for a good performance of the teacher (NINA, 2015).

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In the Social Cognitive Theory by Bandura (1986,1987) one of the main concepts is the one of human agency, in which the subject is proactive, self-organized, as he is able to predict a situation and act even before it happens, self-regulators, self-reflexive. To be an agent means intentionally influencing the very self functioning and its circumstances, not being a passive subject, but only influenced by the environment. In such perspective, the thinking and human action are considered as products of triad: the human behavior, personal factors, environmental factors. This conception is called as reciprocal determinism (FERNANDEZ, 2015). In this context the teacher needs to believe that he is competent to exert his function, that he is capable of achieving the objectives, institutional and personal goals related to his profession, and to develop a positive belief in his own capacity of fulfilling successfully his teaching practice, developing a resilient profile that can progress in positive manner facing adverse situations, aiming to overcome obstacles (NINA, 2015). Bandura (1986, 1987) defines the beliefs as self-efficacy, they interfere in the choice of an action, in the effort, in the persistence and in the feelings that are manifested when facing adversities. The beliefs of self-efficacy are perceptions that the individuals have about their own capacities, and are responsible for the human motivation, well-being and personal achievements, it is also a critical determinant of the manner as the individuals regulate

their thinking and behavior (FERNANDEZ, 2015). It is understood that self-efficacy might promote the necessary motivation to exert a certain role in the society, contributing for the achievement of the proposed objectives. In the case of teachers, self-efficacy might contribute for an efficient execution of the teaching practice. The teachers' self-efficacy, for its turn, is the teacher's belief in his capacity of organizing and executing courses of action important to achieve success at specific tasks of teaching (FERNANDEZ, 2015). Bandura (2008), in the Social Cognitive Theory, suggests that the individuals build their beliefs of self-efficacy analyzing and interpreting information from four main sources: (a) Direct Experience – which consists in the interpretation of an individual's anterior behavior; (b) Vicarious Experience – it is the experience through the observation of relevant social models; (c) Social Persuasion – verbal support form colleagues, incentives by people that are significant for the individual; (d) Emotional/affective States – the level of fatigue, anxiety, stress, among other physiological manifestations that might affect the self-efficacy. To study the beliefs of self-efficacy from the teachers' perspectives is relevant for academic researches, because through the investigations we can understand how teachers think, self-motivate, behave in everyday life of the teaching practice and feel having experiences that contribute positively or even negatively for their careers as education professionals. Therefore, it is relevant to verify which is the state of art of Brazilian researches about the subject given it importance for the teaching practice. The present article has as objective to build a panorama of the Brazilian researches on Basic Education Teachers' self-efficacy through the systematic review of the literature, considering the period from 2006 to 2016. With the intent of identifying the findings referring to the construct, and in concomitant order to find possible gapes.

MATERIALS AND METHODS

The present study consists of a systematic review of the literature about teachers' self-efficacy and has an exploratory and descriptive character. For the fulfillment of this research some methods were established in order to identify, select and critically evaluate the material. According to the Cochrane Collaboration – a worldly acknowledged institution for following rigorous methods for researches of systematic review (RAMOS, 2015) – seven steps must be accomplished: a) formulation of the problem question; b) localization and selection of studies; c) critical evaluation of the studies; d) data collection; e) data analysis and presentation; f) data interpretation; (g) improvement and update of the review (RAMOS, 2015). The first step (Step A) for the fulfillment of this study was the formulation of the question that guided this review, for such the national context of studies in the field of teachers' self-efficacy was considered. Through this, it was possible to define the following question: Which is the panorama of researches about teachers' self-efficacy in Basic Education? The formulation of this question was based in the technic of PVO, where P (problem situation, participants or context) refers to teachers in school context; V (study variable) Self-efficacy; O (expected result) aims to identify the panorama of studies about the subject matter (RAMOS, 2015). The stage of location and selection of studies Step B) involved the definition of some descriptors. The selection of the descriptors considered different terms referring to the components of the PVO technic, which resulted in the following locators: self-efficacy; teacher; teachers; basic

education. For the location of the material searches were made at the Capes journals – which is a virtual library highly acknowledged in the academic field having several national and international publications of articles, reviews, theses among others; Scielo – virtual library providing vast collection of publications being articles and/or theses; Google Scholar (advanced search) – tool of academic research that enables a rapid and easy access to scientific publications. For the critical evaluation of the selected studies (Step C)some inclusion criteria were predetermined, namely: (1) to contain in the title, abstract and/or keywords the above mentioned descriptors; (2) to be complete and available free of charges; (3) only articles from the last 10 years (2006 – 2016); (4) only sources in Portuguese. All the articles that did not obey the criteria of inclusion mentioned were discarded. In the process of data collection (Step D) the following variables were searched: 1) Keywords of the articles; 2) Objectives of the studies analyzed; 3) Methodology presented; 4) Main results obtained. For the analysis and data presentation (Step E) a mixed approach was used (quanti-quali). In the quantitative phase the frequency analysis was applied, as well as the use of data analysis through Graphs and central measures from the tool *NodeXL*. In the qualitative phase the Content Analysis was used – this method consists in a group of exploration technics of documents that aim to identify the main themes and concepts approached in a certain text, at the end of the analysis useful indicators will be provided, which must be related to objectives proposed by the research (OLIVEIRA, et al, 2003). The results achieved were interpreted in the light of the Social Cognitive Theory by Albert Bandura (1986) (Step F). The finalization of the present article was given through the improvement of the final text of the systematic review (Step G).

RESULTS AND DICUSSIONS

Refining process of the objects found

When fulfilling the initial survey on the databases 107 articles were found through the application of the descriptors: "self-efficacy AND teacher OR teachers"; "self-efficacy AND basic education". Namely, in the virtual library of CAPES/Journals – 28 articles were found; in the database of SciELO it was possible to find 19 objects; in Google Scholar (advanced search) – 60 articles. After this survey, the pre-established criteria of inclusion for this systematic review, namely: (1) to contain in the title, abstract and/or in keywords the above mentioned descriptors; (2) to be complete and available free of charges; (3) only articles from the last 10 years (2006 – 2016); (4) only sources in Portuguese. The Table 1 presents the process of refining of the objects found on the searches, considering the three databases. Throughout the process 92 objects (86%) were discarded for not corresponding to the criteria of inclusion above mentioned, remaining only 15 articles for the present analysis. About 70% of the articles were discarded for they had not been applied to teachers of Basci Education, therefore they were not fit for this review. The remaining 30% were excluded for not being available free of charges.

Characterization of the selected studies

Year of publication

When considering the low index of articles found, having analyzed the year of publication of the material selected, it was

observed that in course of a decade (2006 – 2016), the year 2015 was the most effective in publications, having 4 records. As for the year 2012, 3 records were found. In 2010, 2013 and 2014, 2 records per year were identified. In the years 2009 e 2011, 1 publication per year was verified. In the years 2006 to 2008 and 2016, there was no match for publications following the criteria applied in this research. Through this data it is important to reflect on the necessity for widening the researches and publication on the subject of teachers' self-efficacy in Brazil. It is highlighted that in the year 2016 only the data from the first seven months were surveyed (Jan-Jul). These data corroborate the findings of recent researches about self-efficacy, which have pointed that the majority of studies about the referred theme were made in North America and Europe, counting only 1% in South America. Specifically, in Brazil, it is still possible to identify a low frequency of studies about teachers' self-efficacy, however it is viewed as a growing field of study (Fernandez, 2015).

Place of research

When analyzing the place of data collection in the researches, it was noted that the majority had their data collected in the South and Southeast regions of Brazil (Rio Grande do Sul – 2, Santa Catarina – 1, Rio de Janeiro – 1, making a total of 4 records; São Paulo with the higher number, obtaining 6 records), followed by Northeast region (Rio Grande do Norte with 1 record). Besides that, three of the researches selected had their data collected in Portugal – even though it is out of the national level, they were selected, for they obeyed all the criteria of inclusion. In one of the records, however, it was not possible to point the place of collection, for it was a study of theoretical nature. It is important to highlight that in the Northeast a low frequency of studies was found (only 1 article) in what concerns the researches about self-efficacy. For its turn, in the North region no records of publication were identified, these data might indicate that in theses regions there is a lack of researches about the referred theme. Such finding corroborates with Fernandez (2015, p.21), who, in her studies, suggests that researches "in the field at scrutiny are still scarce, focusing in the South and Southeast of the country". It also highlights that some of the researchers from Brazil have national acknowledgement, namely: Azzi, Polydoro and Bzuneck (2006), Bzuneck (1996, 2000), Goya, Bzuneck and Guimarães (2008).

Methodology

In what concerns methodology, it was notorious the option made by researchers in developing field researches, about 14 articles were empirical studies. Demo (2000) highlights the importance of this method, because the same enables greater concreteness to the arguments, facilitating the approximation to the practice, in view of that the researcher goes to the *locus* of research. Only 1 article, from the researches analyzed, developed theoretical study of the theme, showing to be dedicated to present the reality about the discussion of teachers' self-efficacy, rebuilding concepts, ideas, theories, about the referred theme (DEMO, 2000). From the empirical researches, 11 (73%) presented quantitative character, this type of study sovers a group of procedures, which aim the measurement, extraction of a mass of data that intend to give subsides to certain research (GATTI, 2004). Only 2 (13%) researches had qualitative nature, this refers to a data collection and treatment without the use of statistical analyzes,

using instruments such as open interviews, reports, testimonials, which are posteriorly categorized and interpreted in the light of a social vision (GAMBOA, 2003). Only one research with mixed character was found, which involves quantitative and qualitative methods. It is important to highlight the need for qualitative studies, based on the construction and interpretation of texts about the social reality around the teachers' self-efficacy. Even mixed studies, which make the correlation of the data, of the measurable, in the light of society (GUNTHER, 2006).

Keyword analysis

In the process of investigation of keywords, the content analysis was used, applying frequency analysis in the terms pointed in the articles, referring to the base categories of the studied researches, it was aimed to identify the degree of importance of the keywords referring to the base categories of the researches analyzed; for such the software Nvivo 10 was used, with which it was verified the incidence of terms in the databases of the present systematic review. The method chosen allowed calculating the frequency and degree of keywords. Therefore, the technic "word cloud" was applied with the software Nvivo 10.Through the analysis of keywords of the material surveyed in this review, it was possible to identify that the category self-efficacy (most frequent word – 15,7%) was more frequently related to the terms: Teachers (10,1%); Education (4,4%); Beliefs (3,3%); Teaching (3,3%). These associations might be justified by the choice of descriptors for the survey of articles, namely: self-efficacy, teacher, teachers, Basic Education.

The other most frequent associations might be explained by the choice of researchers in investigating relations between self-efficacy and other categories related to situations lived in the school context, namely: TIC (Technology of Information and Communication – 3,3%) and Technologies (3,3%); Burnout (2,2%); Physical (2,2%). It is highlighted that the terms TIC and *technologies* deal with the same thematic, technologies applied to teaching, and were used by 3 articles (ZAMBON, et al, 2012; PEDRO & PIEDADE, 2013; ALVARENGA & AZZI, 2013). The keyword *burnout* was investigated by 2 studies (FERREIRA & AZZI, 2010; CARLOTTO, et al, 2015) and the category *physical* refers to the teaching of Physical Education and modern and contemporary Physics, it was studied in 2 articles (IAOCHITE, et al, 2011; ROCHA & RICARDO, 2014). Fernandez (2015), in study of systematic review with international articles, also investigated the keywords and identified that the most used terms in group with teachers' self-efficacy were "satisfaction with work" and "students' performance". Burnout was the 10th most frequent term in her database, confirming that this category has been associated frequently with teachers' self-efficacy. The author Carloto (et al, 2015) performed a quantitative research with 982 teachers from Basic Education, from public and private networks, in the urban area of three cities of the metropolitan region of Porto Alegre/RS. The results obtained pointed that self-efficacy performs a mediator role between the work overload and the dimensions of burnout, which might be explained in what concerns the positive relation between self-efficacy and the feeling of personal fulfillment and well being. The referred author also stresses that teachers with more elevated self-efficacy have the propensity of attenuating the impact caused by the work overload derived from several activities present in the

profession, on the dimensions of Burnout. In other manner, in what concerns the technologies applied to teaching, the author Zambon (et al, 2012) performed a quantitative research in which 34 teachers from Middle School from four public schools from São Paulo participated, aiming to compare the teachers' computational self-efficacy – a psychological variable that influences the teacher's behavior on the use of computers – and personal variables related to the use of computers between two groups of teachers, namely: (1) teachers that worked exclusively with educative software; (2) teachers that taught several disciplines. The results obtained demonstrated that the teachers that already worked with educational software presented more elevated indexes of self-efficacy, compared to the other teachers, who did not have the domain over the tool presented; suggesting that personal experiences (or domain experiences – one of the sources of self-efficacy), which were well succeeded referring to the use of educative TICs might increase the trust of teachers on their beliefs on their own capacity to exert such function.

Analysis of the objectives

For the study of the objectives from the articles investigated the content analysis was used from the process of textual codification. In creating codes, respective to the senses expressed in the databases analyzed, categories and subcategories were indicated, to which specific profiles of the material were applied, forming unities of records (words, phrases, paragraphs), which are compatible with the semantic content. Silva and Fossá (2013, p. 4) explained that the codification is the transformation, "through profiling, adding and listing, based on precise rules about the textual information, representatives of the content characteristics". Therefore, three phases were followed: (1) Pre-analysis – organization and systematization of data; (2) material exploring – construction of operations of codification; (3) inference and interpretation (BARDIN, 1979). It is highlighted that the interpretation of results was done taking as basis the Social Cognitive Theory by Albert Bandura.

Process and codification

The process of codification of the categories was made in 3 stages, namely: (1) construction of the initial categories; (2) intermediary categories; (3) final categories. These stages represent a refining of the codes applied to the unities of records from the adding of the same through codification similarities. The initial categories represent the first exploration on the data basis, they configure the first impressions on the reality collected. Each category is applied to the unities of specific record, these being related to excerpts selected from the objectives of the studies (SILVA; FOSSÁ, 2013). Hence, in the initial exploration of the data it was possible to identify 20 primary categories. After the definition of these categories, a process of refining took place with the progressive grouping of the initial categories, by similarity of codification resulting on 7 intermediary categories. Through the results of this research, it was noted that the teachers from private schools presented a higher level of self-efficacy, justifying relatively the better performance of the students in these schools, in comparison to others, when submitted to exams testing their knowledge. In way so that these private schools, of small size in Middle School, included in the research, which hire young post-graduated teachers are in their majority prone to present in their human resources elevated

levels of self-efficacy. The authors suggest that this information might and must be used in the process of hiring of the body of teachers, for if the teacher has elevated index of self-efficacy, their students will possibly have too (FREITAS; OLIVEIRA, 2010). Castelo and Luna (2012) executed a qualitative research with 8 teachers from Santa Catarina, aiming to understand the relation between the belief of teachers' self-efficacy in High School and their professional identity, contemplating the category of analysis "Identity". A scale o self-efficacy was applied for all the teachers from two selected schools (one public and the other private), after this process 8 teachers were selected (4 from each school), 4 of these teachers presented high index of self-efficacy, and the others presented low indexes of self-efficacy. Analyzing the results obtained, the authors detailed the relation between professional identity and the belief of self-efficacy in the 8 cases studied, including the interest and identification with the profession for believing in their capacities of organization and execution of teaching activities. Thus, the belief of self-efficacy might be studied as one of the components of the process of professional identity construction. All the teachers that participated in the research had a significant time of work, and presented as main source for their beliefs of self-efficacy the direct experience – interpretation of a previous behavior of the individual (CASTELO; LUNA, 2012). Sanini and Bosa (2015) performed a study of case with qualitative approach, having as objective "to verify the beliefs of an educator about her student with autism, in child education and her sense of self-efficacy due to the work fulfilled". An interview was made with the educator from a private school of Child Education from Rio Grande do Sul, she had superior graduation in Pedagogy and specialization on psych pedagogy, she was responsible for a class frequented by a child with autism. The research was made with the educator and the autist student from her class, due to this, it was noted that she was able to develop a relation based on affection and care with the student, overcoming the fear of working with the "different".
The teacher presented the belief in the capacity of development of her autist student, enabling a greater investment in the educability of this student. It was noted that to the sense of self-efficacy it was possible to identify a low belief, being evidenced by the lack of appreciation of her academic formation and the knowledge she had for the fulfillment of her work, besides the feeling of insecurity towards the adequacy of her practice. From this result, the authors highlight the need for new qualitative studies about self-efficacy and the importance of a continuous formation as a way of qualification of the teaching practice (SANINI; BOSA, 2015).

Illness and strategies of coping

From the articles selected, 2 (20%) of them detailed aspects related to the category "Illness and strategies of coping". About Illness, the authors Ferreira and Azzi (2010) performed a theoretical study with the purpose "of resuming discussions about the process of teacher's burnout in the light of Social Cognitive Theory, searching for explaining aspects of the phenomenon for this form of teacher's illness". In their results, it was possible to highlight that is common to find levels of burnout in teachers, because they are submitted to long processes of professional stressors and they do not see themselves as capable of coping with it, besides there is the absence of personal fulfillment and consequently low belief of self-efficacy. On the other hand, teacher that are perceived

with high belief of self-efficacy tend to feel capable of solving academic questions and direct their efforts to solve them, in other words, they deposit their efforts and determine the courses of action in order to execute tasks that have as aim to solve certain problems (FERREIRA; AZZI, 2010). In what concerns the category of strategies of coping, the authors Pocinho and Capelo (2009) performed a research of quantitative nature with a sample composed of 54 Public Basic Education teachers from Portugal, in which they applied questionnaires aiming to evaluate the vulnerability to stress, to identifying sources, strategies of coping – which consists on dealing with, face, cope, giving response to adverse circumstances – and the importance of self-efficacy for these teachers. The results obtained pointed that the factors that initiate the teachers' stress are, overall, related to the inadequate behavior and indiscipline of the students, followed by the pressures of time and work excess. And as for the strategy of coping, it was possible to verify some variables of coping, such as: *Control Strategy* – to think positively, to think in the changes that might be made in that situation, to try working faster and efficiently, to dedicate more time and energy at work; followed by *strategy of scape* – to tell himself/herself that time takes care of the situation, to anticipate the consequences so he/she is prepared for the worst, to avoid being in the situation; and, finally, *Strategy of Symptoms Management* – to take tranquilizers or sedatives, to perform technics of relaxation, to search for company of friends/family. This way, the authors highlight that the low self-efficacy might be considered as predictor of vulnerability to stress, in view of the individual believing to be competent, he/she uses strategies of coping appropriated to carry on the tasks in adequate manner (POCINHO; CAPELO, 2009).

Validation/evaluation of measurement instruments

In this category, 2 articles were selected from the present systematic review. The first is about a quantitative study performed by Iaochite and Azzi (2012), with the objective of "exploring evidences of validity for the development of a Scale of Sources of Teachers' Self-efficacy (*Escala de Fontes de Autoeficácia de Docentes* – Efaed)". 261 teachers participated in this research from public and private Basic Education schools, which were submitted to two instruments of data collection: (1) Questionnaire of characterization of participant and his/her teaching activity; (2) Scale of sources of teachers' self-efficacy (EFAED) elaborated by the authors. When analyzing the results of this research, the authors pointed that has been a relation between the sources of self-efficacy: social persuasion, direct experience, affective and emotional states and domain experience. This fact might be explained with the Social Cognitive Theory, in which Bandura (1997) highlights the need of comprehending that the information coming from one or more sources is evaluated in cognitive manner by the individual and depends on the weight/value that will be destined to each one of them due to self-reflective processes (IAOCHITE; AZZI, 2012). In other manner, also related to the category "Validation/evaluation of measurement instruments" the authors Rocha and Ricardo (2014) carried on a mixed research with a group of 78 Physics teachers for gauging their beliefs of self-efficacy in teaching profession and on personal life. The objective of this study was "to present an instrument of measurement of Physics teachers' self-efficacy beliefs about their work with Modern and Contemporary Physics (MCP)". It was possible to conclude that the questionnaire used in this research consisted in a solid instrument for gauging self-efficacy beliefs in general and about teaching. The authors also emphasize that the questionnaire might be attached to other methodologies and research instruments, which have the objective of continuing the search for the comprehension of relations between beliefs of teachers' self-efficacy, in special those ones that refer to the insertion of topics of Modern and Contemporary Physics in High School, and its behavior; besides the need for relating these instruments with others of data collection with qualitative nature, semi structured interviews, field notes and presentation of conflicts might bring several contributions for this area of research through triangulation of data, in a way so it is possible to understand the role of beliefs of self-efficacy in the human behavior (ROCHA; RICARDO, 2014).

Teachers' Satisfaction

In this category 2 studies were identified, the first one was a study by Pocinho and Capelo (2014) performed with 327 Portuguese teachers from the 1st Cycle of Basic Education (students from 6 to 10 years old), which objective was "to analyze the influence of self-efficacy in professional satisfaction of Portuguese teachers'. The authors highlight in their results that the instructional efficacy and the efficacy in interpersonal relationships are predictors of professional satisfaction. However, when it refers to the relation interpersonal/institutional, the efficacy in the interpersonal relationships tend to increase positively the perception of this relation, but the instructional efficacy tends to decrease this perception. Iaochite (et al, 2011, p. 825) aimed "to identify and to analyze the teachers' self-efficacy (TSF) of Physical Education teachers and the relation with the level of personal satisfaction and disposition to continue in the teaching activity". This research counted on the participation of 220 teachers from public and private schools from São Paulo. Despite the difficult task of managing big classes, with different interests and abilities, the results of this research indicated high indexes of teachers' self-efficacy and were considered by the authors the time of teaching activity and the influence of several sources of self-efficacy – (a) Domain experience/direct; (b) Vicarious experience/observational; (c) Social persuasion; (d) Somatic states/emotional/affective. It is emphasized that the satisfaction perceived by the teacher is one of the fundamental characteristics for the commitment with the role of teaching, besides the fact of a reciprocal consonance between self-efficacy, satisfaction with work and disposition to continue (IAOCHITE, et al, 2011).

Connections Between Researchers

In this systematic review the aim also was to explore the connections between the authors of the articles, which investigated teachers' self-efficacy and were object of analysis in this study. For such, the data exploration through graphs and centrality measures were used, "these are substantiated in technics and computational and mathematic resources for the characterization of the topological structure of the relations'. The software used was Nodexl, through which was possible to calculate "metrics to identify the dynamic interactions, rules of intermediation and degrees of centrality" between the authors of selected articles, "[…] as well as generating graphic representations, in form of diagrams, resulting from the relations investigated" (RAMOS, 2015, p. 34). The objective for the application of this technic was to verify which researchers of teachers' self-efficacy are publishing in group as

result of the investigation of this construct. Figure 1 illustrates the connection between authors.
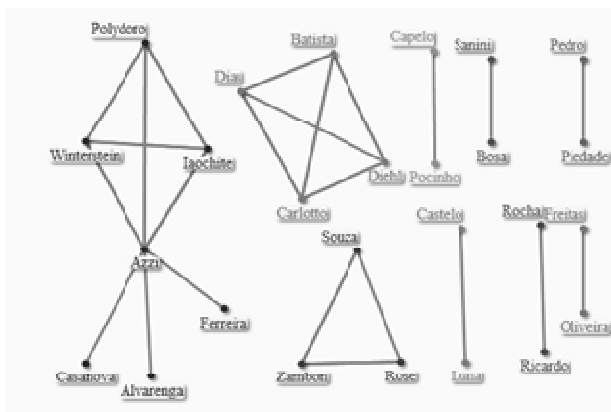
Source: SILVA (2016).

Figure 1. Graphs of connections between authors of the articles analyzed

For the construction of this graph the centrality measure used was Clustering Coefficient/C(G) – to generate groups. A graph is a finite group and non empty composed of vertices and edges, formed by pairs of distinctive elements. The vertices are "elements from any phenomenon, which are connected by edges that indicate any relation between the vertices". Therefore, it is possible to indicate that the vertices are the elements (represented by spheres) and the edges (represented by lines) are the connections between them (RAMOS, 2015, p. 35 and 36). Figure 3 presents an analysis of the centrality measures, through this it was possible to distribute the authors of the articles analyzed in 9 groups. The first, and bigger, is the group composed by Azzi, Iaochite, Winterstein, Polydoro, Casanova, Alvarenga, Ferreira. The second group is formed by the authors Dias, Batista, Carloto and Diehl (represented by the light blue color). The third group was constituted by Souza, Rose and Zambon, represented by dark green color. These three groups stood out for they presented more than two authors connected. The others only presented connections between two authors. For the analysis of graphs and centrality measures, the following metrics were used, namely: (1) Betweenness centrality – to verify the degree of participation of a vertex in the shortest paths of a graph; (2) Closeness Centrality – to calculate how close each vertex is to the others; (3) Page Rank – to measure the level of importance of a vertex in directed graphs (RAMOS, 2015). This way, it was possible to identify the 4 researchers that presented higher indexes in the centrality measures, as it is noted in Tables 1.

Table 1. Authors that presented higher indexes in the centrality measures

Author	Betweenness Centrality	Closeness Centrality	PageRank
AZZI	24	1,16	2,2
Iaochite	-----	1,11	1
Polydoro	------	1,11	1
Winterstein	------	1,11	1

Source: SILVA (2016).

It is emphasized in this analysis the author Roberta Azzi, for having more connections with other authors and also for her quantity of publications in the field. From the articles analyzed, it was possible to find five objects that the referred author participated in the elaboration/publication, namely: (1) teaching, burnout and consideration on self-efficacy theory; (2) analysis on explicative variables of teachers' self-efficacy; (3) scale of sources of teachers' self-efficacy: exploratory study with Physical Education teachers; (4) teachers' self-efficacy, satisfaction and disposition to continue teaching by Physical Education teachers; (5) significant relations between teachers' computational self-efficacy and personal and contextual variables: a study with Brazilian teachers.

Final Considerations

The analysis on beliefs of self-efficacy in the school context is important to wide the academic knowledge, because through investigations like this it is possible to perceive the way how the construct self-efficacy has been being investigated in this field of research. The present systematic review enabled the widening of these information, identifying the findings through the associations of keywords and categories built with the relation between studies. This research identified that the authors, in the period from 2006 to 2016, have related self-efficacy to different aspects of the educational context, such as: technologies, satisfaction, burnout, stress, formation, among others. Besides that, through associations between the objectives studied, it was possible to identify new categories that contributed for the construction and understanding of this construct, namely: (1) illness and coping strategies; (2) general characteristics, identity and teaching practices; (3) validation/evaluation of measurement instruments; (4) teachers' satisfaction. The most investigated category by the authors was "general characteristics, identity and teaching practices" demonstrating that the belief od self-efficacy might be studied as one of the components of the process of construction of the professional identity and for the teaching practice. It is worth noting that the treatment of the data through the method of graphs was very important for the research, being useful to calculate and viewing connections between the authors, identifying the networks of association between researchers in this field. However, it is also possible to identify a low frequency of studies about the referred theme in Brazil. Because of this, it is suggested for future researches to approach self-efficacy as predictor of teachers' satisfaction, because it is possible to identify that self-efficacy might collaborate with the improvement of teachers' practice. Another aspect pointed is the low index of researches with qualitative nature, given that this method very important to understand the social aspects of self-efficacy thematic. In addition, theoretical studies might wide the discussion about self-efficacy in the educational environment. It is suggested for future researches to expand these searches in theses and dissertations, no limited to scientific articles.

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