

The state of the art of government policy and program evaluation methodologies

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Abstract

This research analyzes the conceptual aspects and the state of the art of evaluation methodologies within government policies and programs, based on theoretical and empirical evidence on the subject. This article aims to map the evaluation study and discuss evaluation practices in Brazil, the United States and Europe. It is, therefore, an exploratory and bibliographic research, with a qualitative approach, based on studies indicated in the selected literature. Although the evaluation practices in Brazil are recent and not fully established, the results point out a similarity in the evaluation activities, when compared with the American and European countries. On the other hand, these evaluation practices are still little used in Brazil, which still faces contextual and methodological challenges in the evaluation of public policies and programs, as well as the implementation of continued evaluation policies.

Keywords: Evaluation; Public policies; Governmental programs; Evaluation practices

1. Introduction

The public policy evaluation process is an instrument to verify the effectiveness of government programs. This process is related to issues of effectiveness and performance of public management (RAMOS; SCHABBACH, 2012).

In general, evaluation has become an increasingly common practice in all sectors of society and, consequently, discussed in literature in a very diverse way, considering an area still under conceptual and methodological construction (FARIA, 2005). It is evident the importance and necessity of the evaluation activity in the governmental environment, both as a tool to support management and as a tool to evaluate policies and programs, in order to justify the continuity or redirect public financing (JANNUZZI, 2005). In this sense, Bonifácil et al. (2018) complements that, along the years, the evaluation of public policies and programs started to be considered as an essential activity for the rationalization and optimization of actions and financial resources, in the scope of public management.

In general, the process of evaluation of public policies and governmental programs refers to the planning and structuring of the evaluation activity aimed at understanding the process of execution, results and impacts of a public action, in order to propose improvements and changes needed to improve these actions. (RAUEN et al., 2013)

In Brazil, over the years, the interest in evaluation practices has gained dimension in both governmental

and academic environments. However, there is still some resistance to the dissemination of this practice by the public sector, which for Sá (2020) one of the reasons is the presentation of the results, when questioned about the capacity of the State in the application and management of public resources. On the other hand, the presentation of good results can legitimize the actions and behavior of management (SÁ, 2020).

This article deals with the main conceptual aspects and the state of the art of evaluation methodologies in public policies and government programs, based on theoretical and empirical evidence pointed out in the selected literature on the subject. It also seeks to present a discussion about the relevance of the evaluation of public policies in Brazil and other countries, and its main contextual and methodological challenges faced in the practice of evaluation activity. In this context, this article aims at mapping the study on evaluation and discussing the evaluation practices in Brazil, the United States and Europe, aiming at contributing to the enrichment of studies on the evaluation of public policies and programs.

To carry out the study, an exploratory and bibliographic research was used, with a qualitative approach, based on studies pointed out in national and international literature. And to achieve this objective, the research was divided into four sections, besides this introduction. The second section approaches a brief review of the literature, contemplating the historical context of the evaluation process, its main definitions, criteria and evaluation typologies addressed by scholars of the subject. The third section presents a contribution based on empirical evidence in mapping evaluation practices of government policies and programs, their trends of evaluation studies in Brazil, the United States and Europe. The fourth section presents and discusses the main results of the study on evaluation practices in the national and international scenario, pointing out the main methodologies used, their challenges and needs for improving the evaluation activity of public policies and programs. Finally, the last section brings the conclusion that closes this research.

2. Theoretical revision

This section presents a brief review of the literature, contemplating the historical context of the evaluation process, its main definitions, criteria and evaluation typologies addressed by scholars of the subject.

2.1 Brief historical contextualization

In the field of public policies, evaluation began to play a relevant role in public administration in the twentieth century and, according to Santos et al. (2017), it began to be disseminated in Brazil and Latin America in the 1980s, in the face of a scenario of economic and fiscal crisis in the world. The authors start from the assumption that with the increase in public spending, the need to evaluate public expenditures arose, in face of budgetary limits and the great demand for government policies and public resources (SANTOS et al., 2017).

According to Faria (2005), the role attributed to evaluation evolved mainly in the 1960s, after the boom in public policy evaluation in the United States. In that decade, the emphasis on evaluation prevailed over the information function, where the main axis was program improvement and managers were interested in using evaluation as a feedback mechanism (TREVISAN; BELLEN, 2008). Until the 1970s evaluations were systematic and only in the areas of education and health, according to Fagundes e Moura (2009). This

type of evaluation was restricted to measuring only the achievement of established goals and to adapting the means to the objectives of public policies and programs. This scenario began to change in the 1980s, when the analysis of public policies experienced a boom due to the country's economic, political, and social situation.

In Brazil, studies on public policies are recent (TREVISAN; BELLEN, 2008) and its first efforts towards the evaluation process began in 1960, with the evolution of the role attributed to the evaluative research that, according to Faria (2005), was put at the service of the state reform and seen as a tool for planning and public management. From then on, the evaluative research provoked a growth of studies in public policies, increasing the number of academic production (articles, dissertations, theses and others), creating disciplines in undergraduate and graduate courses, incentive programs by research, development and innovation promotion agencies, specific lines of research in the area, special lines of funding for promotion and specific forums on public policies (ARRETCHE, 2003). At that time, the field of study of public policy evaluation began to use the scientific basis in a rigorous manner to analyze the solutions to social problems, establishing methodological designs that avoided failures in the evaluation process (SÁ, 2020).

The evaluation process began to gain prominence in 1970. For Bonifacio et al., (2018), at that time the predominant discussion was that of a Brazilian development model, following an agenda of research in the area of municipal public policies and decentralization of these policies. Sá (2020) adds that scholars began to link evaluation with research, generating new knowledge based on long-term causes and strategies on public policies, as well as improving government plans and programs in the short term. In the 1980s, evaluation research was driven by the democratic transition (BONIFÁCIO et al, 2018). In the period between 1980 and 1990, based on previous studies, a more complete theoretical model was sought that presents an integral view of policy, going from design and formulation to implementation, covering not only results but also the general context and actors involved (SÁ, 2020).

With the 1988 Constitution and the various initiatives of interest in public policies in the country, it is noticeable that interest in the subject has increased due to recent changes in Brazilian society (ARRETCHE, 2003) and the awareness of the need to use social science methods in implementation to assess the impact of public policies and programs (CRUMPTON et al., 2016).

In 2004, the Secretariat of Evaluation and Information Management (SAGI) of the Ministry of Social Development (MDS) was officially created, the first body specifically instituted to carry out evaluation activities in public policies, together with the Committee for Monitoring and Evaluation of Federal Public Policies (CMAP), (BONIFÁCIO et al., 2018).

2.2 Main definitions and evaluation criteria

The evaluation concept goes beyond the need to control, analyze and justify actions and processes for decision making. When related to public policies, the term evaluation brings the concept of measuring results against proposed objectives and goals. For Dagnino et al. (2002), evaluation constitutes an element capable of selecting problems that need to be considered, evaluating their political social importance.

In this context, Crumpton et al. (2016) emphasizes that the analysis of public policies in the evaluation process becomes a set of research tools that goes beyond identifying problems and proposing solutions. The evaluation of policies, programs and government plans is not the final destination, but an important

tool to improve the efficiency of public spending, the quality management and social control of government actions.

In Costa and Castanhar's (2003) view, evaluation is a way to measure the performance, implementation and results of an action, with the purpose of presenting its efficiency, effectiveness, sustainability, impact and the relevance of its objectives. For Cavalcanti (2006), evaluation is therefore considered an instrument to measure and judge actions through a quantification process that allows the demonstration of numerical indicators or scores on what is being evaluated.

In fact, evaluation is an instrument of great importance for decision makers, with the purpose of guiding them as to its continuity, the need for improvements, or even the interruption of an existing policy or program (RAMOS; SCHABBACH, 2012). It is important to highlight that evaluation plays an important role in public sector reforms, as it has been increasingly present in public policy analysis processes.

Moreover, the evaluation process can be understood as a set of techniques adopting different alternatives in order to interpret government actions and investments, especially when dealing with the process of public policy formulation (DAGNINO et al., 2002). In this sense, evaluation is now seen as a tool capable of promoting benefits that will subsidize decision making, beyond the control of public spending.

In the case of public policies, the concept of evaluation admits multiple definitions, some of which are considered contradictory. For Trevisan and Bellen (2008), evaluation is to determine a pertinent action and reach its objectives, its effectiveness, efficiency, impact and development sustainability. Howlett et al. (2013), on the other hand, define evaluation in simple terms: it is the "stage of the process in which it is determined how a policy is actually working in practice". That is, the evaluation process seeks to identify the impacts that policies have on society.

According to Costa and Castanhar (2003), evaluation definitions refer to the systematic and objective examination of a policy, program or project completed or in progress, related to its performance, implementation, results and impacts. Thus, evaluation should be seen as a mechanism for improving the decision-making process to ensure better information on which to base their decisions and better account for public policies (TREVISAN; BELLEN, 2008). These authors also reinforce that the purpose of evaluation is to guide their managers as to the continuity of public policies, the need for improvement or even their discontinuity. In other words, the evaluation process must establish essential criteria to determine the continuity or not of a government policy or program, and can be considered a "set of research tools that goes beyond identifying problems and proposing solutions" (CRUMPTON et al., 2016).

However, it is important to note that the practice of evaluation can contribute to improvements in the planning and formulation of public interventions, as well as in the social control of the efficiency and effectiveness of government actions (CRUMPTON et al., 2016). This practice involves judging the values of a program or policy implemented, with the purpose of providing information that can seek improvement in decision making in the public system. Still according to Crumpton et al. (2016), this process requires the definition of criteria to be adopted and the set of attributes and characteristics considering the extent of the policies or programs to be evaluated.

Table 1 presents the main criteria to be used in the process of evaluating programs and public policies.

Evaluation Criteria	Definitions
Efficiency	Relationship between the results and the costs involved in the execution of a project or program.
Efficiency	Measure of the degree to which the program achieves its objectives and goals.
Impact (or effectiveness)	It indicates if the project has (positive) effects on the external environment in which it intervened, in technical, economic, socio-cultural, institutional and environmental terms.
Sustainability	Measures the ability to continue the beneficial effects achieved through the social program after it has ended.
Cost-effectiveness analysis	Similar to the idea of opportunity cost and the concept of relevance; the comparison of alternative forms of social action to obtain certain impacts is made in order to select the activity/project that meets the objectives with the lowest cost.
Satisfaction of the beneficiary	It evaluates the user's attitude towards the quality of the service that the program is getting.
Equity	It tries to evaluate the degree to which the benefits of a program are being distributed in a fair and compatible way with the user's needs.

Source: adapted from Ramos and Schabbach (2012), Brotti and Lapa (2007), Costa and Castanhar (2005), Cotta (1998)

The evaluation process requires a way of measuring and judging the performance of programs and public policies, and it is essential to define criteria for evaluating the results obtained (COSTA; CASTANHAR, 2003). These authors highlight the importance of selecting appropriate evaluation criteria, which vary according to what is specified in the process.

In this sense, Costa and Castanhar (2003) reinforce that the application of these evaluation criteria depends on operationalization to identify and quantify the results obtained in the process, which can be done by means of evaluation indicators, allowing the measurement of the achievement of predetermined objectives. In this sense, Cotta (1998) highlights that the selection of criteria varies according to the type of evaluation and the phase of the evaluation process in focus.

2.3 Types of evaluation of public policies and programs

The evaluation should provide information that is possible and useful to enable the incorporation of the experience gained into the decision-making process. It is observed that, in the face of this statement, the process of evaluation demands to reflect, plan and reach proposed objectives, with the purpose of bringing the understanding that evaluation research is articulated to the educational, social and political process of a country.

In literature this subject is quite vast and a theme of such complexity. For Cavalcanti (2006) the types of evaluations seek to respond to the problems of formulation and implementation of public policies and government programs, offering effective subsidies for decision-making.

The evaluation typologies are found in different forms of classification in the literature, considering the position of the evaluator, the nature of the evaluation, the evaluation methodology, the time of its completion and the question to be answered (CUNHA, 2018; SANTOS; RAUPP, 2015; SIMÕES, 2015; RAMOS; SCHABBACH, 2012; PATTON, 2008; COTTA, 1998).

Using the evaluator's position criteria - who evaluates and who participates in the evaluation process - external, internal, mixed and participatory evaluations are classified. The external evaluation is carried out by specialists who do not belong to the institution executing the program being evaluated, usually professionals who have experience in this type of activity. Despite not having specific knowledge about the program, the external evaluator usually tends to maintain its neutrality, objectivity and impartiality during its evaluation (RAMOS; SCHABBACH, 2012; PATTON, 2008).

When the evaluation process is under the responsibility of the institution executing the program, it is called internal evaluation. This type of evaluation is performed by professionals belonging to the managing institution, with the collaboration of people who participate in the program. In this case, when the professionals are directly linked to the program management and execution, Cavalcanti (2006) calls this operation self-evaluation -considering a subtype of internal evaluation- where the evaluators examine their own activities and may not be entirely objective and impartial. The author reinforces that the internal evaluation must be "performed by professionals who are part of the institution responsible for the program, but who are not effectively involved in its execution" (CAVALCANTI, 2006).

In the case of mixed evaluation, as the name already says, it combines the two previous types, considering the participation of external and internal evaluators, working together or independently (CUNHA, 2018), in an attempt to balance the unfavorable conditions and reinforce the favorable ones of the evaluation process (CAVALCANTI, 2006). The participative evaluation, on the other hand, foresees the beneficiaries' performance in the planning, execution and evaluation of actions. For Simões (2015), this type of evaluation does not seek to provide specific information on the impact of a government policy or program, but rather on the perception of the participants.

In relation to the nature of the evaluation - as to its purpose - it can be classified as formative or summative. The formative evaluation is related to the formation of the policy or program and seeks the generation of knowledge to structure and identify improvements in its implementation process. The information generated helps those who are directly involved, providing elements to make corrections to procedures to support and improve the process (CUNHA, 2018; SIMÕES, 2015; TREVISAN and BELLEN, 2008). Summative evaluation refers to the analysis and production of information on both the implementation and previous steps. The information is generated during the execution of the policy or program with the purpose of ascertaining its results, assessing whether its objectives are being achieved and how much it is adding value to society (SIMÕES, 2015; RAMOS and SCHABBACH, 2012).

As far as methodology is concerned, evaluation is classified into qualitative and quantitative models and the difference is more in the type of data than in the design (WEISS, 1998). Qualitative evaluation refers to what cannot be measured. The qualitative research seeks to provide an evaluation of scientific research, with the most descriptive and exploratory character. For Simões (2015), this model acquires relevance by analyzing processes, cultures and behaviors in specific contexts and social perceptions about intervention to the detriment of measuring its results, focusing on the subjectivity of the objective to be analyzed. Ramos

and Schabbach (2012) consider an evaluation mechanism relevant to the analysis of policies and program management, as well as the institutions that execute them.

The quantitative evaluation refers to what can be quantified, presented through numbers and information. For Ramos and Schabbach (2012), this model is a scientific method that adopts the collection and processing of statistical and econometric data and methods in order to quantify information about a given program. The quantitative research seeks to analyze the problem situation, the evolution of indicators, the goals and results of the program and the evolution of the social, economic and environmental picture in the time space (SIMÕES, 2015).

When it comes to the time of its realization, the evaluation studies differ in *ex ante*, *in itinere* and *ex post*. The *ex ante* evaluation is performed before the program starts, in order to support the decision to implement it or not (CUNHA, 2018). The main information of this modality of evaluation is the diagnosis, helping the allocation of resources according to the objectives proposed by the program. In addition, Ramos and Schabbach (2012) emphasize that this evaluation model uses techniques of cost-benefit and cost-effectiveness analysis of the programs. The authors reinforce that these techniques can collaborate with the decisions of the programs even before their implementation.

The *in itinere* or *itinerary* evaluation is performed during the program execution process. Its objective is to verify if the governmental actions implemented through the programs are generating expected results and if it is necessary to make some adjustments or adaptations in the program being monitored (SOBRAL; SANTOS, 2018)

And finally, the *ex-post* evaluation that is carried out during the execution of a program or after its conclusion, when decisions are based on the final results achieved (RAMOS; SCHABBACH, 2012). In this type of evaluation, evidence is sought to support whether the program being executed has continuity or not, should be maintained in its original format or undergo modifications, based on the results obtained up to the time of evaluation. According to Cunha (2018), the *ex-post* evaluation is the most methodologically carried out and has the greatest application lately. In this case, if the evaluation is of a program already concluded, the relevance of reproducing the experience in the future is analyzed (SIMÕES, 2015).

Regarding the question to be answered - what is evaluated - the modalities of process evaluation, results and impacts are classified. The evaluation of processes is carried out during the implementation of a program and refers to the management dimension (CUNHA, 2018). According to the authors Ramos and Schabbach (2012) and Cunha (2018), this is a modality of periodic evaluation, which seeks to detect the obstacles that occur during its process, with the objective of making corrections and adjustments, serving as a support to improve the efficiency of the program's operationalization.

The evaluation of results aims to assess the intermediate results of the intervention and seeks to identify to what extent the program has achieved its objectives. In addition, it presents its effects and consequences and if there was any change in the problem situation that originated the preparation of the program, after its implementation (RAMOS; SCHABBACH, 2012).

In the evaluation of impacts, the focus is on the return on investment. This type of evaluation seeks to measure the effectiveness of the program or public policy, as well as verify whether the final results with society meet what was proposed, that is, whether it produced the effect it expected (CAVALCANTI, 2006).

For Cotta (1998), the difference between the evaluation of results and impact evaluation depends on the purpose of the analysis:

If the objective is to inquire about the effects of an intervention on the clientele served, then it is an evaluation of results; if the intention is to capture the reflexes of this same intervention in a broader context, then it is an evaluation of impact (COTTA, 1998, p. 113).

The evaluation of results refers to the analysis of effectiveness, that is, whether the program or policy has been implemented in accordance with the guidelines established for its execution and whether it has achieved the proposed goals. The evaluation of impacts refers to the effects of the program or policy on society as a whole (SILVA et al., 2016).

For Cunha (2018) the evaluation process is conducted from a specific point in the life cycle of a policy or program, and consists of in-depth research in order to verify whether what was originally planned was effectively met, especially regarding its effectiveness, efficiency and effectiveness. In the public policy cycle, evaluation is at the last stage, where results are presented and the entire process is reviewed in order to improve policies (BONIFÁCIO et al., 2018).

3. Empirical evidence

This section presents a contribution based on empirical evidence in mapping evaluation practices of government policies and programs, their trends from evaluation studies in Brazil, the United States and Europe.

3.1 Policy and program evaluation practices in Brazil

The practice of evaluation has become increasingly important at the governmental level, both to subsidize management support tools and to evaluate policies and programs in order to justify their continuity, the need for improvements and the redirection of financing, when appropriate.

In order to contribute to the strengthening of the evaluation agenda and to know how the evaluation practices of International Cooperation projects in Brazil¹ work, Costa (2018) presents a study that investigates how public agents see the evaluation process, how they carry out this activity, the types of evaluations and methods used, the use of their results and their perspectives. This research provides an overview of evaluation practices and seeks to contribute to the discussions in the field of evaluation (COSTA, 2018). Thus, the author brings a broad knowledge on the subject and emphasizes the maturation of evaluation activities, their new methods and the advancement of new practices in the country.

Involving the international scenario, Crumpton et al. (2016) point out a study that compares the practice of evaluation of public policies carried out in Brazil and in the USA, with the objective of presenting the degree of establishment of research in evaluation in these countries. The authors used methods of bibliometric analysis, comparing academic articles published in the last 10 years. Among the results of the study, they point out that the two countries have been acting in research and publication in the same areas of knowledge, especially in the field of health, education and social welfare, using the same methods of

¹ Carried out by the Federal Government and some national institutions that are also part of the Brazilian cooperation

data analysis as well. In addition, the study highlights the consolidation of research in evaluation in the USA, both in the field of study and in practice. Unlike Brazil which, although there is evidence of advances in research and an effort by Brazilian researchers, the country is not yet with this practice fully established (CRUMPTON et al., 2016).

Considering the Brazilian government demand, Sobral and Santos (2018) present a study of three cases of evaluation of public policies in C,T&I, which served as a basis for developing a methodological proposal for ex ante evaluation, that is, before implementation, evaluation in itinere, which occurs during the execution process, and ex post evaluation, after implementation, from the perspective of subsidizing government actions and propose recommendations for improvement and continuity in public policies (SOBRAL; SANTOS, 2018).

In this context, Cunha (2018) brings a discussion about the evaluation practices in the scope of the Multiyear Plans of Brazil, adopted by the federal government and the state of Rio Grande do Sul and their contributions to decision making in the implementation of programs and public policies. In this study, the author characterized it as an intermediate evaluation practice, of a formative nature, mostly conducted internally, with the objective of assisting managers on the need for improvements in the operationalization of programs. In this way, the author emphasizes that in this evaluation model the focus ends up being only on the results of the programs and not on the impacts of government actions on society. Both levels of government have noted the need for advances in the evaluation system, especially in terms of integration between the evaluation and monitoring processes, and some stages of the public policy cycle (CUNHA, 2018).

Rossi et al. (2004), proposes a complete research study, based on the logical design of intervention in the practice of evaluation of public policies, called "life cycle of programs". This design contemplates a comprehensive evaluation plan, with emphases in the investigation of the program implementation process (Program Process Assessment), in the evaluation of its impacts and results (Impact Assessment) and finally, in the evaluation of efficiency or cost-effectiveness (Efficiency Assessment) (ROSSI et al., 2004). Based on this proposal, Jannuzzi (2011) presents a conceptual and methodological contribution of monitoring systems and evaluation studies of government actions, specifically in the management of social programs in Brazil. For this author, the monitoring and evaluation processes complement each other and should be carried out in accordance with the maturity stage of the program to be evaluated, regardless of the types of research. This research proposal is presented as a technical-scientific undertaking, using social research methods throughout the "life cycle" of public programs (JANNUZZI, 2011).

3.2 Evaluation practices: international analysis

The United States and Europe are highlights in public policy evaluation studies. In addition, these countries are considered benchmarks in evaluation practices, especially when it comes to policies to encourage innovation in companies, as is the case of economic subsidy programs also executed in these countries.

For Vedung (2010), historical advances in the evaluation process have reached countries at different times and with different intensities. In this context, the author points out that the development of the evaluation initially took place in the United States, where he began the study in the area of public policies.

In the USA, the analysis of public policies and programs occurs, at the same time, both in the governmental

and academic spheres (BONIFÁCIO et al., 2018). In the governmental sphere it is traditionally practiced at the three levels: federal, state and municipal. The evaluation activities are carried out on a large scale, in a systematic way and practiced by agencies that are in charge of the implemented programs (CUNHA, 2018).

The American evaluation practice is conducted by central agencies such as the Government Accountability Office (GAO), the government agency responsible for evaluation. Evaluations are conducted by external experts, called ad hoc, and/or program managers, in order to examine the performance of public policies, both in the achievement of their objectives and in the context in which this occurs (CUNHA, 2018). Aiming to support the evaluation process, Ramos and Schabbach (2012) emphasize that the U.S. government seeks to insert in the agencies the participation of university researchers and consulting firms. This joint effort aims to develop more in-depth studies and propose new policies.

The World Bank, the United Nations (UN) and the Organization for Economic Cooperation and Development (OECD) are international organizations that have a primary role in structuring and strengthening institutionalized evaluation practices (RAMOS; SCHABBACH, 2012) and have a tradition of evaluating programs to encourage innovation, such as Small Business Innovation Research (SBIR) and Technology Innovation Program (TIP), developed in the United States and considered one of the most important in the world (LEAL, 2018; VARELLA, 2013).

Europe has also developed a study identifying and using practices of innovative evaluation methodologies, with multi-sectoral coverage (OLIVEIRA; PASSADOR (2019)). In European countries, the evaluation practice is similar to that of the United States, which has sought to develop metrics, based on contextual and econometric studies, to compare the relationship between investments in innovation programs and policies (spending on RD&I) and the impacts on economic development (increased productivity and wealth) of a given region (LEAL, 2013).

Edler et al. (2012) analyze evaluation practices in national innovation policy across Europe, drawing on the Repository² of 171 evaluation reports within the European Union, in an attempt to compare evaluation profiles from different perspectives. The study sought to understand the real needs and discuss the practices of the evaluation process in a comparative manner, following a distinct methodological approach, using meta-evaluation and meta-analysis techniques to evaluate the overall design, implementation and its functionalities in order to learn about the evaluation itself (EDLER et al., 2012, p. 4).

The international scenario brings relevant experiences and indicated the need to establish an institutionalized structure for the realization of evaluation practices and, in the conception of Bonifacio et al. (2018), these practices should involve specific concepts and techniques that should be part of the whole evaluation process. In this way, international experiences can provide input to the evaluation process for decision-making before, during and after the execution of programs and policies in Brazil.

4. Results and discussions

This section presents and discusses the main results of the study on evaluation practices in the national and international scenario, pointing out the main methodologies used, their challenges and needs for improving

² INNO-Appraisal database, developed by the University of Manchester, funded by the European Commission.

the evaluation activity of public policies and programs.

4.1 Main types of evaluation and analysis techniques used

The main studies refer to a diversity of methodologies that evaluate the effectiveness of programs and public policies. According to the national and international experiences presented, it is noted that the main interests of the current evaluation practices are "results, rational budget allocation and reorganization of programs in order to achieve planning objectives" (CUNHA, 2018, p. 54).

In order to know how the evaluation practices of International Cooperation projects work in Brazil, Costa (2018) used the online survey methods and semi-structured interviews to analyze eight dimensions of the Brazilian international cooperation evaluation area, among them the use of evaluation as a regular practice, the types and methods of evaluation used and the use of the results. In relation to the frequency of the evaluations, the research has revealed that 39,1% of the institutions maintains the evaluation practice, 21,7% has an expressive evaluation activity and that only 8,6% realizes this activity in an intense way. For the author, this reveals a heterogeneous scenario in the evaluation process of the organizations.

About the type of evaluation used, it was noticed a predominance of internal evaluations (48%), followed by external evaluations (22%) and mixed evaluations (17%), which approximate internal and external evaluators at the same time. Although the study presents a predominance of internal evaluation, Costa (2018) corroborates the importance of external evaluation bringing to the institution a differentiated view of the program or policy and an analysis with more impartiality, without any institutional link and bureaucratic conflict (SOBRAL; SANTOS, 2018) Regarding the methods used, Costa (2018) presented a predominance in the use of mixed methods (quali-quant) (52%), only qualitative (22%) and quantitative (10%). It also reinforces that qualitative methods are those that provide more subsidies for improvements, as well as better explain the results presented.

Another highlight of the survey was the use of the results of the final evaluations, used in large part to subsidize new partnerships and the elaboration of future projects and, on the other hand, the low dissemination of the results to society (COSTA, 2018).

In view of the results presented in the Costa (2018) study, it is noted that there is no systematic evaluation of the products generated, in general, in the organizations, but there is an effort to improve evaluation practices, considering necessary to justify the contribution of resources and the continuity of actions. The author reinforces the existence of institutions that are maturing in the field of evaluation, with some experiences considered successful in the area of evaluation of Brazilian international cooperation, but emphasizes that there is no exchange of these specific experiences in evaluation (COSTA, 2018).

Still in the national scenario, Sobral and Santos (2018) conducted an experiment involving three procedures for evaluating public policies in the area of Science, Technology, Innovation and Education (C, T, I&E). In this study the authors proposed methodological models aimed at evaluating the types *ex ante*, *in itinere* or *itinerary* and *ex post*. The first procedure consists in the analysis of the Strategy for Expansion of Higher Education in Brazil, previously evaluating the public policy before its implementation, using the *ex ante* evaluation type. In the following procedure, the *in itinere* or *itinerary* type of evaluation was used, in order to verify the progress of the execution of the Professional Master's Program in National Network Mathematics, that is, if the expected results were being generated and if they needed to adopt improvements

during its execution. Finally, in the third model, an ex-post procedure was carried out in order to evaluate the results and impacts of the Brazilian Public Schools Mathematics Olympiad after its implementation (SOBRAL; SANTOS, 2018). The experience with the elaboration of the three methodological models allowed the authors to present recommendations and essential evidence for the cycle of government programs to promote C, T, I&E, as well as the evaluation of their public policies.

On the other hand, Santiago et al. (2015) present a methodology focused on the evaluation of a patent portfolio for licensing purposes. This methodology is divided into two macro-phases: classification and technology evaluation. In the first stage, potential markets for the technology are assessed, considering the eligibility for patent licensing (i.e. whether it can be licensed). The second phase is a logical sequence of the classification phase to define licensing fees in which company patents and patents licensed by other companies in the same industry are analyzed to use them as a benchmark. Although robust enough, the methodology of Santiago et al. (2015) is focused on the technology licensing process from an existing portfolio within the organization itself. This makes it difficult to apply to organizations without a patent portfolio that is consistent with the analysis one intends to undertake.

In the United States, innovation incentive programs are traditionally evaluated. In methodological terms, the evaluation practices of Small Business Innovation Research (SBIR) and Technology Innovation Program (TIP) can also be applied to other programs, considering the following elements: i. statistical analysis or econometric studies; ii. research based on beneficiary case studies; and iii. research based on social rate of return case studies (LEAL, 2018, p. 92). For the author, the evaluation seeks to understand the scope of innovations and commercialization, on the part of the beneficiaries, through data made available by the program's funding agency. It also seeks to evaluate the capacity to stimulate entrepreneurship and its economic and social impacts on American society.

Link and Scott (2009) evaluated the contributions of the SBIR program, in the short and long term, within the companies that received the incentive in the last ten years. In this study, specific contexts, databases and performance indicators of the program and the probability of commercialization of the product or process were explored, adopting the method of analysis of ordinary least squares (SILVA, 2013). Other studies present a diversity of methods for evaluating U.S. policies and programs, involving the evaluation of efficiency, ordinary least squares method, analysis of input and output variables, fixed and dynamic models and regression analysis (LINK; SCOTT, 2009; SILVA, 2013).

Cunha (2018) and Edler et al. (2012) highlight that the European Union recommends the practice of institutionalized evaluation, mainly in areas of P,D&I and in programs promoted by Structural Funds³. Thus, the evaluation activity becomes an integral part of innovation policy in European countries. The design and evaluation reflect the terms of the program formulators, where 90% of the evaluations are carried out by those responsible for the operationalization of the program (internal evaluation), and 10% are internal and external evaluations at the same time, designed in the annual evaluation plan of this particular program (EDLER et al., 2012).

In Europe, the analyses presented in the study by Edler et al. (2012) show a considerable degree of uniformity between evaluations. Regarding the moment of evaluation, the authors point out that 40% of

³ More than 20% of the assessments presented in the Repository are carried out in the context of the European Structural Funds.

the evaluations are intermediate (in itinere), 30% ex post and 30% in both moments. The ex ante evaluation does not appear in the analysis. Most of the evaluations combine formative and summative nature (50%), 30% are only formative and 20% summative, which are directly related to the characteristics and methods applied. For the authors, although the formative evaluation is the most recommended by specialists, because it brings more the context, the consistency and the process of the program, it is the summative evaluation that leads to a broader discussion and a more definitive adjustment for the program or policy studied (EDLER et al., 2012). In this case, the authors suggest that for a better quality evaluation, approaches and purposes of formative and summative nature should be combined.

On the other hand, Santiago et al. (2015) present a methodology focused on the evaluation of a patent portfolio for licensing purposes. This methodology is divided into two macro-phases: classification and technology evaluation. In the first stage, potential markets for the technology are assessed, considering the eligibility for patent licensing (i.e. whether it can be licensed). The second phase is a logical sequence of the classification phase to define licensing fees in which company patents and patents licensed by other companies in the same industry are analyzed to use them as a benchmark. Although robust enough, the methodology of Santiago et al. (2015) is focused on the technology licensing process from an existing portfolio within the organization itself. This makes it difficult to apply to organizations without a patent portfolio that is consistent with the analysis one intends to undertake.

In the United States, innovation incentive programs are traditionally evaluated. In methodological terms, the evaluation practices of Small Business Innovation Research (SBIR) and Technology Innovation Program (TIP) can also be applied to other programs, considering the following elements: *i.* statistical analysis or econometric studies; *ii.* research based on beneficiary case studies; and *iii.* research based on social rate of return case studies (LEAL, 2018, p. 92). For the author, the evaluation seeks to understand the scope of innovations and commercialization, on the part of the beneficiaries, through data made available by the program's funding agency. It also seeks to evaluate the capacity to stimulate entrepreneurship and its economic and social impacts on American society.

Link and Scott (2009) evaluated the contributions of the SBIR program, in the short and long term, within the companies that received the incentive in the last ten years. In this study, specific contexts, databases and performance indicators of the program and the probability of commercialization of the product or process were explored, adopting the method of analysis of ordinary least squares (SILVA, 2013). Other studies present a diversity of methods for evaluating U.S. policies and programs, involving the evaluation of efficiency, ordinary least squares method, analysis of input and output variables, fixed and dynamic models and regression analysis (LINK; SCOTT, 2009; SILVA, 2013).

Cunha (2018) and Edler et al. (2012) highlight that the European Union recommends the practice of institutionalized evaluation, mainly in areas of P, D&I and in programs promoted by Structural Funds. Thus, the evaluation activity becomes an integral part of innovation policy in European countries. The design and evaluation reflect the terms of the program formulators, where 90% of the evaluations are carried out by those responsible for the operationalization of the program (internal evaluation), and 10% are internal and external evaluations at the same time, designed in the annual evaluation plan of this particular program (EDLER et al., 2012).

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Regarding data analysis, the study refers to a variety of evaluation methods. Some evaluation practices of limited use, such as advanced quantitative approaches, such as: and input and output analysis (26%), econometric analysis (23%), cost-benefit (23%), counterfactual (22%) and control group (20%). On the other hand, studies involving more simplified qualitative approaches are observed, such as simple descriptive statistics (76%), context analysis (67%), document analysis (52%) and case study analysis, considering the most used method for data analysis (EDLER et al., 2012).

Regarding data collection methods, Edler et al. (2012) states that the evaluative analyses were performed through monitoring data (80%) and existing databases (70%). Other data collection methods were interviews and surveys with program participants. Bibliometric and techno metric surveys are little used methods (2%) in data collection. For the evaluation of results, whether short or long term, specialized knowledge in the area and analysis by peers, which are very relevant when it comes to the evaluation of innovation programs, are necessary.

It is also noticeable that in the empirical literature, both national and international, the proposals for evaluative analysis use methodologies involving several typologies, and foresee the evaluation of processes, results and their impacts (CUNHA, 2018).

4.2 Main challenges encountered

Every evaluation process ends up having to face a series of challenges, whether conceptual, contextual or methodological (COSTA and CASTANHAR, 2003). In other words, in any kind of evaluation, the conduction of an evaluation process of policies or programs of innovation requires, in fact, the confrontation of specific challenges, which can be either in the methodological, conceptual or practical aspect (RAUEN, 2013).

In fact, the challenges and implications for the development of evaluation methodologies present some particularities and differentiated needs. In this context, Rua (2010) presents a series of challenges to be faced when applying an evaluation, among them: i) dealing with the limitations related to the main sources of information from administrative records; ii) another source of information are the beneficiaries, from which direct data is obtained; iii) it is essential to evaluate the contexts; iv) open the possibility of evaluating unanticipated results; v) evaluation be able to absorb changes over time, feeding back into policies, programs and projects; and vi) open the possibility of innovation-oriented evaluation (RUA, 2010, p. 2-3). For Rauen (2013), these challenges alter not only the coherence of the evaluation, but also the evaluation process itself. From the same point of view, Costa and Castanhar (2003) state that the practice of evaluation

in the public sector is considered a major challenge, especially with regard to defining practical ways to measure the performance of the program and provide this information for its management, as well as for other agents involved. This information is considered useful for evaluating the effects of public programs, their need for correction, or even the interruption of the program if it presents a negative effect (COSTA and CASTANHAR, 2003).

Santos and Raupp (2015) emphasize that, despite efforts to develop useful information that can be used to review and correct government policies, programs and plans, the monitoring and evaluation process remains a major challenge for public management.

It is worth pointing out that the evaluation process represents a strategy of mutation in the managerial model of public management. According to Rua (2010), this strategy causes policies and programs to be evaluated for compliance with their goals and objectives. The author also reinforces the importance of its managers to naturally encourage these strategies, in order to make use of the information himself, seeking a good monitoring of their performance as compared to their objectives.

It is relevant to note that the growing challenges in evaluation practices have led to the investigation of new perspectives for the evaluation process of its impacts, so that a new generation of methods, techniques and tools seems to be emerging from the need to make the challenges come from the complexity of the theme (SANTOS et al., 2004).

Another challenge presented by Santos and Raupp (2015) refers to the achievement of a direct link between the results achieved through policies or programs and government strategy and with the goods and services offered to society. Still according to the authors, the monitoring and evaluation proposal opens a path that makes it possible to follow the physical and financial goals proposed in the PPA in a format that does not require a high degree of detailing of the planning instruments, avoiding budget reallocations during financial years (SANTOS; RAUPP, 2015).

In this concept, Rauen (2013) identifies three major challenges for the evaluation of policies and programs to promote innovation in Brazil. These challenges are faced by both *ex ante* and *ex post* evaluations. Even if described separately, the challenges are not independent of each other. In fact, each challenge influences the others, feeding back into the evaluation difficulties.

For Rauen (2013), the first major challenge refers to the use of indicators, both of results and impact. For the author, in Brazil there is still a great deal of confusion regarding definitions and the dynamics of the innovative process itself. The second challenge is associated with understanding the cause and effect relationship between public intervention and the observed result or impact. And the third challenge is an object of research in the sociology of science and technology and concerns the aversion to the evaluation of research activities by individuals outside the academia (RAUEN, 2013).

When it comes to new indicators, the challenge is to think about how to obtain data to compose the baseline of indicators selected to express each result or performance (RUA, 2010). In this sense, Ramos and Schabbach (2012) state that one of the main challenges of the evaluation is to demonstrate that the results found are causally related to the products offered by the policy or program. In other words, the challenge is to define the scope of the evaluation, its objective, who should be involved and, finally, how to build an evaluation and decision process that leads to effective results (CUNHA, 2018).

For Jannuzzi (2011), better structuring the systems of monitoring and evaluation indicators, as well as

specifying more consistent evaluation surveys, are considered challenges that need to be quickly addressed at the three levels of government (federal, state and municipal). In addition, methodological difficulties eventually lead to the use of indicators that apply predominantly to aspects of policy or program production, in achieving the proposed goals or objectives (COSTA; CASTANHAR, 2003).

Another important challenge concerns internal capacity building and effective participation of managers in the debate on methodologies and results of the evaluation process. Managers who are at the forefront of implemented policies need to be clear about which questions they intend to answer in relation to the policies that will be evaluated, which are the best indicators and methodologies to answer these questions, and which information needs to be generated for this purpose (DE NEGRI, 2013). It is relevant to note in this regard the challenges and possibilities of operating an evaluation methodology that takes into account the nature of the program and the means available (COSTA; CASTANHAR, 2003)

For De Negri (2013), one of the main challenges for the implementation of a monitoring and evaluation policy in public institutions is to integrate these activities within a systematic and routine planning that makes it possible to continue the process of evaluation of C, T&I policies, as well as the exchange of experiences between the different evaluations carried out.

Finally, it is important to emphasize that the implementation of systematic evaluation in public policy processes involves great challenges. On one hand, the contextual and methodological challenges inherent to the evaluation of policies and programs. On the other hand, the institutional challenges in the implementation of a continuous evaluation policy (DE NEGRI, 2013).

5. Conclusion

The search for greater effectiveness and economy of public policies and the greater capacity of the government to meet society's demands and needs has made the insertion of the evaluation process in the management cycle of government policies and programs increasingly important. When carried out in a systematic, integrated and institutionalized manner, the evaluation practice shows the efficiency of public resources. It identifies the possibility of improvements in the process and results, directly contributing to public management development and improvement.

Several studies refer to various experiences in evaluation, both national and international, to provide a critical reflection on the evaluation practices in the governmental scope and discuss the most used approaches, concepts, techniques, and evaluation methods, allowing a better standardization for public policy evaluation routines.

This article aimed to map the study on evaluating public policies and government programs and discussing evaluative practices in Brazil, the United States, and Europe. For this, the conceptual aspects, the typologies and techniques of analysis, and the state of the art of the methodologies for evaluating public policies and programs were analyzed based on theoretical and empirical evidence pointed out in the studied literature. When analyzing the evaluative practices pointed out in the national and international scenario, it is observed that the evaluation process goes beyond identifying problems and proposing solutions, requires an in-depth and specific study of the life cycle of the policy or program, where the results are presented, and the entire process must be reviewed before (*ex ante*), during (*in itinere*) and after (*ex post*) its implementation

(SOBRAL; SANTOS, 2019; BONIFÁCIO et al., 2018; CUNHA, 2018, EDLER et al., 2012). The authors defend the importance of using appropriate and specific methods and techniques for carrying out the evaluative activity, aiming at a more accurate and intense investigation.

In Brazil, evaluation practices are recent and little used, besides facing contextual and methodological challenges in the evaluation of public policies and programs and the implementation of continued evaluation policies. Unlike the United States and Europe, the analysis and evaluation of public policies and programs are old practices in developing public policies and worked systematically and continuously.

There is a growing search for evaluative activities in the American and European experience and a degree of uniformity of evaluation designs. Generally, this process is developed in an institutional structure, involving specific concepts and techniques. What is no different here in Brazil, when the evaluation methods are compared, the results point to a similarity in these evaluative activities.

The study also demonstrates that, although there is a wealth of evaluative practices in the international environment, with successful experiences and maturation of specific institutions for this purpose, there is little exchange of experiences between countries (COSTA, 2018). In this sense, Bonifácio et al., 2018 reinforce the importance of stimulating exchanges between them to discuss recommendations and good evaluation practices. The authors defend the creation and structuring of research networks involving research institutions, universities, and the governmental sphere (CRUMPTON et al., 2016). Besides, they suggest developing strategies for the dissemination of collected data, the methodologies performed and the sharing of information obtained (COSTA, 2018; CRUMPTON et al., 2016).

Finally, the studies pointed out that Brazil's evaluative practices are recent and are not fully established, despite the results pointing to a similarity in the evaluative activities compared with the American and European countries. On the other hand, these evaluation practices are still little used in Brazil, which still faces contextual and methodological challenges in evaluating public policies and programs and the implementation of policies for continuous evaluation.

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