

Technological development and Innovation from shared management in professional education: rede Itego, Goiás, Brazil

Desenvolvimento tecnológico e Inovação a partir da gestão compartilhada na educação profissional: rede Itego, Goiás, Brasil

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ABSTRACT

This work reports the results of the experience in implementing a modern management of the REDE ITEGO – a network of Technological Institutes of the State of Goiás, Brazil – within the cities of Anápolis and Catalão. It was possible to prove the relevance of planning and evaluation, to reach qualitative and quantitative goals in Technological Development and Innovation actions. Recent historical data obtained from the SIGA – a computerized academic management system – were analyzed. This work concludes by the success in the shared management process, even if it combines competing efforts for Professional and Technological Education parallel to Technological Development and Innovation actions.

Keywords: educational management, planning, professional and technological education, technological development and innovation.

RESUMO

Este trabalho relata os resultados da experiência na implantação de uma gestão moderna da Rede Itego - Rede de Institutos Tecnológicos do Estado de Goiás, Brasil - nas cidades de Anápolis e Catalão. Foi possível comprovar a relevância do planejamento e da avaliação, para o alcance de metas qualitativas e quantitativas nas ações de Desenvolvimento Tecnológico e Inovação. Foram analisados dados históricos recentes obtidos do SIGA - sistema informatizado de gestão acadêmica. Este trabalho se conclui pelo sucesso no processo de gestão compartilhada, ainda que reúna esforços competitivos para a Educação Profissional e Tecnológica paralela às ações de Desenvolvimento e Inovação Tecnológica.

Palavras-chave: gestão educacional, planejamento, educação profissional e tecnológica, desenvolvimento e inovação tecnológica.

1 INTRODUCTION

Professional and Technological Education (EPT), foreseen in the Law of Directives and Bases of National Education (LDB) (BRAZIL, 1996), should prepare the citizen for the professional exercise and, for that, it seeks to enable him to qualify him and professionalize it for your entry and stay in the world of work and life in society, but in line with the demands of industrialization and the information age (BRAZIL, 2020).

Moura, Filho and Silva (2015) discuss the expansion of federal institutes, and points to the presence of the Brazilian State through professional education institutions in the peripheries of the capitals and in regions further away from large urban centers, expanding the possibilities of many Brazilians to access needed skills.

Mauro Sérgio (DE et al., 2020) states that:

“The expansion of the network and, as a result, the expansion in the provision of professional and higher education was based on the premise of providing renewed instruments in local and regional development”.

In this study case, State of Goiás’ Government has always implemented public EPT policies through the Development and Innovation Secretariat (SEDI) until 2014, through its Professional Training Centers - CEPA. In July 2015, through Law No. 18,931, State of Goiás’ Government created the Technological Institutes of the State of Goiás - ITEGOS and Technological Schools - COTECS, a network with 30 (thirty) ITEGOS. The objective of this article is to analyze the effectiveness of the Planning and Educational Assessment processes, in the implementation of shared management in DIT actions, within the REDE ITEGO’s network units, in the cities of Anápolis and Catalão, in Goiás, Brazil.

2 THEORETICAL FOUNDATION

Considering the complexity of the management and operationalization of this ITEGOS network, the Goiás’ Government has chosen to make a Public Call, so that the management will be shared between the Public Partner - SEDI and the Private Partner - a Social Organization duly accredited by the State of Goiás. Thus, “Public Call 07-2016”, governed by the State Law of Goiás 15,505 of December 28, 2005, established the guiding criteria for this operation, which consisted of implementing the shared management model between SEDI and a Social Organization.

In addition, this shared management model was based on clear and established criteria such as, quantitative goals of courses to be offered in training, qualification,

technical and higher technology categories in the presential and distance education (EaD) modalities.

Regarding distance education, NASU (2020) highlights that:

“It is also necessary to consider the context of contemporary society in which the changes occurred in the form of communication represented by the phenomenon of cyberculture and cyberspace in which digital information and communication technologies (TDIC) support new ways for individuals to relate in society , also enable new ways of working, teaching and learning”.

Therefore, the scope of the project also established the supplementary Academic Practical Activities (APA) as a differential in the ITEGO’s pedagogical project, aiming at the integral formation of the student, aligning the theory foreseen in the course plans, with the experience with the technical-scientific world and at work.

ITEGOs also must provide DIT services, through education, entrepreneurship, research and the extension of innovation and technology transfer activities to the productive sector. This includes innovation and technology transfer activities, as well as the provision of technological services, in order to promote and strengthen innovation environments in Business Incubators, Local Productive Arrangements (APLs) and other segments of the productive sector.

SANTOS (2019) carried out a relevant study of REDE ITEGO in the city of Catalão, and observed that:

“Technology transfer occurs through knowledge, development and technology by the environment that did not generate it. As a result of this perspective, it is necessary for innovation to be transferred through the action of technology transfer, and the mechanisms for innovation offer competitive strategies for the development of companies, making them more competitive for the market. The interactions between the different actors (research institutions, universities, government and industry) are fundamental to the success of the innovation model”.

New technologies, both for presential classes and for distance education, have also started to be employed due to the demand for more flexible courses, executed at a distance basis and asynchronously oriented, as evidenced by Do Nascimento (2020):

“[...] a new era in educational processes, with the growing development of media resources for application in the teaching-learning process, until the necessary conditions were developed for the process itself to become fully mediated by technological tools, with the advent of Distance Education (DE) ”.

Among all elements of monitoring and controlling DIT actions, the following stand out:

- i. The projections of the plans to achieve quantitative and qualitative goals; and

ii. Periodic assessment to achieve quantitative and qualitative goals.

The quantitative targets established for daily, semi-annual and annual monitoring compute: student enrollment, student training hours, students attended at APAS, DIT hours.

For the execution of the quantitative goals to occur in a sustainable way and become the REDE ITEGO's network organizational culture, some dimensions and aspects of evaluation or indicators were established.

3 METHODOLOGY

The research methodology was based on the hypothetical-deductive method, through the construction of conjectures (MARCONI & LAKATOS, 2017). It was built from data related to DIT, collected from Instituto Reger and SEDI, from 2017 to 2020, with coverage was limited to the pole cities of Anápolis and Catalão, both within Goiás, Brazil.

Data were collected from ITEGOS, managed by the Instituto Reger in these locations, from Institutional Documents, such as:

- i. Current Number of Employees;
- ii. Number of Enrolled Students; and
- iii. Course Quantities.

Regarding the first year of execution of the management contract, in 2017, the Immediate Assumption Plan was analyzed, presented to the Public Partner when signing the "Management Contract 01-2017-SED". This Plan was the first planning that guided how operational management would be.

Following the Immediate Assumption Plan, an Educational and Evaluation Planning was prepared, which was also the object of analysis for this work.

Another instrument used for this work was the Satisfaction Survey with students, constituting the collection instrument elaborated based on the dimensions and aspects of evaluation or indicators already established by the public partner in "Public Call 07-2016".

For better monitoring, a flow of information collection was established, and the use of the SIGA (the computerized academic management system), in order to obtain daily data from the teacher and student, and the monitoring of school dropout (DE REZENDE GUEDES & DA VEIGA JARDIM FILHO, 2020).

Finally, statistical data were extracted from SIGA, which stores and processes the academic records of courses, axes, components, classes and students.

To facilitate the understanding of these goals, the Balanced Scored Card - BSC method was followed. Thus, an Indicators Manual was prepared to train employees and managers, and its Strategic Map were evaluated (DE REZENDE GUEDES, 2020).

4 RESULTS AND DISCUSSION

From the Institutional Documents' analysis, it was found that the DIT's quantitative planning had, in fact, a qualitative bias, for example: for each planned course, there was a preparation of activities and materials that were generated in the perception of students, teachers and the community .

It was found that the DIT's activities planned sought to fill gaps in the local innovation ecosystem, formed by all associations that operate in the promotion, support, financing, execution of activities that result in innovative products, processes and businesses.

Based on the evaluation criteria, it was possible to extract, from SIGA, the achievement of quantitative and qualitative goals, according to the tables below.

Table 1: Quantitative and Qualitative Goals from Dez/2017 to Jun/2020.

Year	Satisfaction survey	Qualitative goals achievements	Quantitative goals achievements
2017	89,00%	85,05%	82,24%
2018	82,45%	85,31%	79,12%
2019	86,35%	88,57%	90,20%
2020	86,00%	49,47%	58%

Fonte: SIGA, 2020

Table 2: Qualitative Goals from Abr/2017 to Nov/2020.

Model	Category	Goals	Executed	Achievement percentage %
Presential	Superior	860	689	80%
	Technical	3780	1826	48%
	Qualification	13440	11094	83%
	Capacitation	20300	20040	99%
Distance education	Technical	864	893	103%
	Qualification	4968	6090	123%
	Capacitation	14784	17402	118%
	TOTAL	58996	58034	98%
OTHER OFFERS	DIT	34560	34041	98%

	APA	6720	7925	118%
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It is important to highlight that, in spite of Instituto Reger's efforts to achieve the EPT goals, which challenged the efforts for the DIT; there was a correspondence in percentages of goals achieved, both for EPT and for DIT, including with emphasis on APA activities.

It was noticed that another challenge of the DIT actions, was the sensitization to the entrepreneurship of students and the served community, which had as purpose the social and economic transformation of these societies.

It was found that a schedule of training activities for collaborators and focused administrative technicians had been established. Workshops and planning rounds in a systematic and periodic way, because at first due to the quantitative goals being high for full achievement.

5 CONCLUSIONS

From the study of Institutional Documents, it was found that REDE ITEGO promoted DIT actions and services, effectively and efficiently, into achieving the goals established, focusing on the potential and vocation of each Local Productive Arrangement (APL) within Goiás, through of three mechanisms:

- i. Technology Transfer and Innovation: It involved interaction and knowledge exchange activities aimed at the companies of the respective APLs, focusing on the bottlenecks for technological development and innovation;
- ii. Technological Services Delivery: Offering rare or nonexistent technological services in the regions served, which allowed businessmen, especially micro and small ones, to access high-tech equipment and laboratories to carry out collaborative productive activities, tests and trials; and
- iii. Strengthening of Innovation Environments: Establishing spaces conducive to the generation and strengthening of nascent innovative businesses, such as Business Incubators, Startups and Technology Parks.

It is noteworthy that, in view of all the assessments, the fundamental aspect for the success of the shared management model for the DIT were:

- i. Implementation of the computerized academic management system SIGA, developed by a contracted company and customized specifically for use in the REDE ITEGO's network;

- ii. Standardization of processes and procedures, participatory management activities forming Governance;
- iii. Standardization of monitoring of quantitative and qualitative goals of DIT hours and students attending APA; and
- iv. Corrective actions by technical management.

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