COSTING SYSTEMS FOR USE IN PUBLIC UNIVERSITIES: THE BRAZILIAN AND INTERNATIONAL CONTEXT

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ABSTRACT

Quality in public administrator management through planning tools for controlling spending, more specifically of public costs is that motivated this work. This paper will show the importance of controls costs through the information system, as a management tool to ensure proper planning and allocation of public resources of public HEIs. Its central theme is the cost of measurement in public universities, through a survey of implementation of case costing systems in Brazil and abroad. Such research is necessary for comparisons and trends in the control of costs. Therefore, we proceeded to a systematic literature review, to highlight the state of the art in the implementation of costing systems in public higher education institutions. We conclude that in general European public universities using the activity-based costing. However, it is suggested the study and implementation of activity-based costing and time to be more appropriate and terms of time and cost of deployment.

Keywords: universities, public sector, costing, ABC, TDABC.

1. INTRODUCTION

Higher education is responsible for training professionals for all sectors of the economy. A study by the National Institute of Studies and Research Anísio Teixeira, linked to the Brazilian Ministry of Education showed that in 2011, the percentage of investment in higher education amounted to 0.9% compared to the Gross Domestic Product of the country (Inep, 2012). This was approximately USD 20 billion.

Disclosure of costs is essential in the organizations, whether private or public. Although more than measure, one must know that order if you want to know the costs and the measured costs meet these objectives. Therefore, you should use effective management tools that show processes and their costs to serve as a basis for decision making for the assessment and monitoring of budgetary, financial and patrimonial (Araújo, 2011).

This paper aims to present the adoption of costing methods in public universities in the Brazilian and international context, in order to encourage those concerned an overview on the studies on this subject. It is believed that the works cited can contribute in some way with the professional costs and managers who have an interest in the control and quality of public spending.

The justification of the issue is related to academic interest, analysts and society in general to verify the relevance of cost information, your reflection in public spending, especially in the adoption phase of costing systems in public universities.

2. METHODOLOGY

The research is exploratory in nature, which consists in the study area in which there is little accumulated knowledge, aiming to provide greater familiarity with the problem, to make it more explicit.

Beuren (2010) points out that a characteristic of exploratory research is to deepen preliminary concepts on specific topic not covered previously satisfactorily. Contributing to the establishment of issues superficially researched on the subject.

The theme known as activity-based costing and time is not present in Brazil, but is now widespread in the United States from the perspective of companies. In public universities, is still a little explored and studied subject.

As for the approach, this research will be essentially qualitative. Richardson and Peres (1999) treat this approach as studies that use qualitative methods can describe the complexity of a given problem, analyze the interaction of certain variables, understand and classify dynamic processes experienced by social groups.

3. LITERATURE REVIEW

3.1 Costing in Brazilian public universities

The design of a system or a cost model in the public sector is in addition to the legal requirement, a necessity for any entity (Araújo, 2011). However, a problem related to the rationalization of resources is the impossibility of relocation between headings of the public budget funding and capital (Durham and Goldemberg, 1993). Consequently, the IES would not be concerned about costs and the quality of public spending, but with the money available for their expenses.

In 1989 there has been concern with the development of indicators related to the Brazilian public higher education, such as cost-benefit, cost-efficiency and cost-effectiveness (Campino, 1989). Therefore, cites the concept of value for money, which presupposes the existence of an alternative market (private) to assess what would be the cost of the resource opportunity. This cost-effective as the cost for goal achieved unit, to report what the goals that society expects of a particular industry. However, does not define or conceptualize the cost-efficiency.

The educational process uses four types of inputs: the student's time, the teachers and staff time, facilities and equipment, and consumables. As for the products, are three: research production, hand training of skilled labor at the undergraduate level and graduate and the satisfaction of cultural needs of the educational system user, which could be termed higher education consumption. While the first two can be considered "intermediate products" for the productive sector, the latter can be understood as a final product that meets the demand of consumers (Schwartzman, 1994). Argues that the combination of inputs and the methods by which the institution operates are called educational processes.

Egea and Ariza (2005) suggest a methodology based on the quantification of each activity by time spent by workers in their activities to provide information economic performance of universities. They argue that generates a lot of flexibility to be able to reflect the many economic benefits that arise between the different activities, processes and services. As each university is performing measurement object through the time involved, this allows us to send them to a homogenization process and thus have economic data on the elementary units of action of any organization through the activities and thus obtain financial information on any action of the university, for successive aggregations of activities in order to achieve useful information for the management of each of the organizational levels that the University is structured.

The consideration of time as well as other variables of strategic interest, is key to economic management of the entities in view of the complexity and competitiveness that characterizes the current economic scenario. In addition, some entities, such as utilities, which characterized by intensive use of labor, it is concluded that the tilt performed temporal processes can become a good unit performance measurement, indicative of the production line and therefore variable allowing standardize all business performance. Thus, the expression of business achievements in the same unit of measurement is useful in the future to develop economic information about them (Egea &

Ariza, 2005) (Ortega Egea, Rodríguez Ariza, & López Pérez, 2007).

The Ministry of Education (MEC) created in 1988 the development of a cost calculation system for federal institutions of higher education. This turned into a subsystem of the Management Information System (Peter, Pessoa, Pinho, & Peter, 2003). This subsystem was called System Cost Calculation (SAC).

It is noticed that there is a discontinuity of efforts in implementing this type of control, because in 2001 the system utilization corresponded to 54% of those, and the results showed inaccurate results (Peter, Pessoa, Pinho, & Peter, 2003). Is not research or subsequent documents on the scheme, including on the website of the Ministry. It is suggested that this phenomenon has occurred by changes in policy and management.

In 2001, federal Law No. 10,180 was enacted with the purpose of organizing and disciplining Systems Planning and Federal Budget, Financial Federal Administration, the Federal Accounting and Internal Control in the Federal Executive Branch. Among the activities of the federal accounting system, art. 15, V, deals with the registration of acts and events related to budgetary, financial and patrimonial management of the Union, as well as the disclosure of the costs of programs and units of the Federal Public Administration (Brasil, 2001a).

In 2005 there was a proposal, academic, methodology to calculate the cost of federal institutions of higher education in Brazil (Reinert, 2005). However, limited to the use of indicators and the use of time teaching activity as sharing criterion without considering the processes involved in those.

In 2009, the Federal Accounting System was regulated by Decree No. 6976, which deals among other matters, the jurisdiction of maintaining a cost system that allows the evaluation and monitoring of budgetary, financial and property (Brasil, 2009b).

The federal government implemented its Cost Information System (SIC) in 2011 through Ordinance STN 157 of March 9, from Machado proposal (2002) (STN, 2011a). Later that year, defined the powers of those Central and Cost Sector through Ordinance No. STN 716 of 24 October (STN, 2011b). According to Brazil (2013, p.44): SIC is a technological tool (software) that has the ability to integrate various systems of the Federal Government in a single database (data warehouse), storing, gathering cost information that enable support decision-manager's decisions.

SIC Federal Government allows the effective measurement of costs under the administrative point of view from the central organs of planning, budgeting, accounting and finance. Your goal is to meet uniformly to all organs and agencies of the federal structure. Its unique feature is its ability to integrate diverse systems into a single database.

On December 28, 2011, the Executive Secretary of the Ministry of Education issued Decree No. 1749 creates the organizational structure of the Planning and Budget Secretariat, the Sector Authority's Ministry of Education Cost System (Ministério da Educação, 2011a).

Only in 2014 the Ministry of Education has set up a Working Group, through Ordinance SE/MEC No. 135, in charge of discussing the implementation of guidelines Cost System under the ministry (Ministério da Educação, 2014b).

3.2 Costing at public universities abroad

International research demonstrates the importance of proper ownership costs. Therefore, suggest the use of Activity-Based Costing and will be addressed below.

Kaplan and Cooper (1998) define the activity-based costing as an economic map of the expenses and the organization's profitability based on organizational activities. This costing system offers companies an economic map of its operation showing the existing and projected cost of activities and business processes that, in turn, explains the cost and profitability of each product, service, and customer operation.

One of the methodologies used, adapted and applied in European universities is the ABC. Terms such as "Cost Object", "cost centers" and "cost factors" are associated with the "true costs" or "total cost" of teaching, research and extension. Although research projects, courses or students can be seen as the "products" or "cost objects" of educational institutions, language and managerial accounting methods do not have a common understanding (European University Association, 2008).

Ahumada (1992) states that the use of a costing system, and its usefulness as a management tool is also relevant in formulating policies for higher education. By analyzing the case of the University of Monterrey in Mexico, explains the differences in costs between seven faculties of the institution are the following: the student-teacher relationship, the average class size and the total number of each college courses.

In 1994, the United Kingdom, one-fifth of universities used the ABC costing system with satisfactory results. What surprised the research is that institutions use the system as allocation tool of the costs of academic departments and not in terms of products (Mitchell, 1996).

Cropper and Cook (2000) conducted a study on the implementation of the costing system based on activities in UK universities in the second half of the 1990s and concluded that the deployment occurred in a slow, even with pressure from donors and government.

McChlery and Rolfe (2004) mention the pressures that the UK universities lived for improving the quality of financial reporting. To this end, developed a settlement model that uses ABC concepts and Value Based Management (VBM), focusing on the allocation of costs to objects and not to activities. Proposes that the costing even the most operational levels of the institutions, for example, in modules or research projects, taken in marginal costing and full funding. Your contribution is therefore calculate the value added activities.

At the University of Cadiz has developed a model for the calculation and cost management. The model is based, in part, the traditional models costing to maintain the organizational structure of the budget and the ABC concepts to analyze each of the activities and their costs, in each unit, and relate this to the cost budget expenditures effectively consumed for each activity. The information generated by the model include: the cost of each credit education and academic department, the sub-activities of costs carried out by departments and the cost of each undergraduate course per student, together with the extent of under-utilization of resources by groups in each center (Valderrama and Sanchez, 2006).

The generated cost information was included as part of the documentation to be used by the

working groups were formed to produce a strategic plan for the University of Cadiz. The process began with the costs of the auxiliary centers. These include the offices of vice-chancellors, centralized the dean's office services (including personal services, financial management and procurement and contracts), IT services, maintenance, library, experimental courses and so on. The main activities were the research, teaching and services supplied in each department, and the costs of these activities have been allocated directly to each of the undergraduate courses, since the cost drivers identified for each course.

According Valderrama and Sanches (2006) described the model provides useful information for all decision makers, not just for accountants. The model could be used, for example, in the development of rational policies for the approval or rejection of proposed doctoral programs or postgraduate courses, or for the admission of students. This cost calculation method allows public universities, regardless of where they are located, meet two objectives. The first is to manage more efficiently the resources of these institutions, being able to identify the activities and their costs, and be able to get information on the results achieved by departments and faculties or centers. The second is to exercise adequate control over the legal execution of the public budget.

For Krishnan (2006) the ultimate purpose of the ABC system is to assign all costs incurred for the activity product or service. As in the case of the cost of university is assigned to each student as the center of activities costs incurred as a result of service provided to students.

In ABC costing the activity analysis shows clearly the head of the department which is cost paid by the division in the assignment for each student and whether this cost is justifiable for the provision of the service. This system also eliminates activities that do not add value, to show the actual cost of the room. He concludes that this costing system can also be used as a performance assessment tool to evaluate the performance of a division of a year to the next.

The determination of effective cost plays an important role in strategic decision making. The ABC system provides more accurate cost management and enables university administrators to calculate the real cost, the product for students. It is crucial for the effective implementation of the system that ABC project team must be released from normal duties and the university should be prepared to invest in computer technology (Krishnan, 2006).

ABC can be applied in universities, because information obtained through the application of this tool help in making better decisions, as well as in optimization of resources (Gallegos, 2007).

According to Abu-Tapanjeh (2008) the cost of an activity is an important component for each decision. Thus, the development of an information accurate and relevant cost courses and programs involved with adequate allocation of activities to assist visualization of a suitable cost effective, consequently, provide a good image for management. ABC aids in way to control the loss of revenue and increased costs. This allows a number of benefits over how resources are allocated to the academic divisions and how they are used.

The author argues that the application of ABC in educational institutions can provide a lot of benefits for management.

ABC system is a robust and beneficial approach to provide useful information to universities, to help assess the budgetary and programmatic problems accurately and reliably (Abu-

Tapanjeh, 2008).

In Malaysia, in 2009, there were 20 public higher education institutions and 25 private. The financial departments of these institutions were asked about the use of traditional techniques and advanced management accounting techniques. The survey revealed that 82.4% of private universities used performance indicators, against 26.7% of public universities. As the use of the ABC are 47.06% in private versus 20.0% of the public (Zubir Azhar & Kamal, 2009). This shows that private universities are more concerned with the use and optimization of financial resources, for seeking the improvement of its management with the adoption of new controls of advanced techniques.

The adoption of innovations in advanced techniques of management accounting by the Malaysian universities is needed to better serve its operations and activities, it provides information in support of a management policy formulation, direction, organization, planning and control activities (Zubir Azhar & Kamal, 2009).

Ismail (2010) tested a simplified model of ABC Accounting in a school of a public university in Malaysia obtaining promising results. He suggests the adoption of the methodology for all public universities in the country so there is a fairer criterion for allocation of the budget of the Ministry of Higher Education.

In Croatia, universities need new sources of financing of its activities, partly because the state pays for salaries, materials and little research. To conquer other funding sources the University of Zagreb has initiated a pilot control project costs through benchmarking with other European universities (Dražić Lutilsky & Dragija, 2012).

In the Faculty of Social Sciences, University of Porto, Lima (2011) developed a model similar to ABC system, because according to the author, it is advisable for some departments, such as IT support services, Marketing and Communication Advisory and the Library. Services Financial and Maintenance and Ancillary Services have specific operating characteristics that make it difficult to implement the ABC system, so it would be advisable to use a closer of traditional costing system models. For other departments, the administrative services and the Student Aid Office, applies to the ABC as a traditional system.

Research, such as Costa Marques (2012), emphasize the need to adopt cost control systems for Portuguese universities. The author makes a comparison between the activities of the universities with the provision of services and emphasizes the analysis of revenue in relation to the activities, also known as Activity-Based Resource (ABR). In other words, the activities should be compared in terms of revenue and costs so there is a proper analysis.

The research concludes that the ABC system is suitable because it sets forth the cost allocation needs to always start in the activities of the organization, offers a more objective method of calculation that the forms used by traditional costing systems.

The application of the ABC system for costing universities is possible to observe and analyze the behavior of costs, especially indirect costs, since the production process consumes resources. The information obtained is useful for the analysis of pricing, results and potential investments. The ABC system considers the diversity and complexity of processes, so that the costs

(or other activity) can be determined more accurately (Costa Marques 2012).

Moghadam (2013) estimated the total cost of students from different courses, as well as the efficiency of the administrative staff and faculty of Shahid Beheshti University in Iran. The survey was conducted in the levels of undergraduate, master's and doctoral degrees. However, suggests the implementation of a cost model based on activity-based costing.

In surveys conducted by Kaplan and Anderson (2007) on the implementation of ABC, were noted the following problems:

• The process of interviews and survey were slow and expensive.

• The data were subjective and difficult to validate.

• The data were expensive to store, process and report.

• Most deployments were local and not provide an integrated view of profit opportunities across the enterprise.

• It could not be easily updated to adapt to new circumstances.

• The model was theoretically incorrect when he ignored the potential of unused capacity.

The time-driven activity-based costing (TDABC) simplifies the costing process, eliminating the need to interview employees and search for cost allocation of resources to activities before allocating them to cost objects (applications, products and customers). The new model assigns resource costs directly to the cost objects, using an elegant structure that requires only two sets of estimates, none of which is difficult to obtain (Kaplan & Anderson, 2007).

It is therefore a contemporary methodology of funding that should be studied and applied in the university context.

4. CONCLUSIONS

The need to increase the supply of places, improvement in research and further integration of the extension activities require more and more resources from public universities. It is necessary that managers use their resources properly in order to avoid waste.

This article demonstrated how higher education institutions in a Brazilian and international context control your spending. In Brazil, some public universities participate in the development of the Cost Information System, applied to the entire federal government. In Europe, they seek to use of activity-based costing methods.

However, a new methodology for costing, not yet explored these organizations is the activity-based costing and time. This new technique should be widespread because it reduces deployment time and costs. Adequate knowledge of time-driven activity-based costing methodology is gain factor regarding the efficiency of public administration provided for in the Brazilian Federal Constitution.

REFERENCES

Abu-Tapanjeh, A. (2008). Activity-Based Costing Approach to Handle the Uncertainty Costing of Higher Educational Institutions: Perspective from an Academic College. *Journal of King AbdulAziz University: Econ. & Adm., King AbdulAziz University, Kingdom of Saudi Arabia*, *22*(2), 29–57.

Ahumada, M. M. (1992). U.S. methods for costing in higher education: taking the technology abroad. *Higher Education*, *24*(3), 363–377. doi:10.1007/BF00128452

Araújo, M. B. (2011). A contabilidade de custos como instrumento de gestão no setor público. *Conjuntura & Planejamento*, (170), 42–49.

Beuren, I. M., (Org.) (2010). *Como elaborar trabalhos monográficos em contabilidade: teoria e prática* (3rd ed.). São Paulo: Atlas.

Brasil (2001a). *Lei nº. 10.180, de 6 de fevereiro de 2001*. Organiza e disciplina os Sistemas de Planejamento e de Orçamento Federal, de Administração Financeira Federal, e dá outras providências. Diário Oficial [da] República Federativa do Brasil, Brasília, (July 02, 2001).

Brasil (2009b). *Decreto nº. 6.976, de 7 de outubro de 2009*. Organiza e disciplina os Sistemas de Planejamento e de Orçamento Federal, de Administração Financeira Federal, e dá outras providências. Diário Oficial [da] República Federativa do Brasil, Brasília, (August 10, 2009).

Brasil (2013c). *Sistema de Custos do Governo Federal: O que é? Para que serve? E como isso afeta meu dia a dia?* Brasília: MF, STN.

Campino, A. C. C. (1989). *Custo do ensino superior*. NUPES, Núcleo de Pesquisas sobre Ensino Superior, Universidade de São Paulo.

Costa Marques, M. C. (2012). Contribución del modelo ABC en la toma de decisiones: el caso universidades. *Cuadernos de Contabilidad*, *13*(33). Retrieved from http://revistas.javeriana.edu.co/index.php/cuacont/article/view/4282

Cropper, P., & Cook, R. (2000). Activity-Based Costing in Universities-Five Years On. *Public Money and Management*, *20*(2), 61–68. doi:10.1111/1467-9302.00213

Dražić Lutilsky, I., & Dragija, M. (2012). Activity based costing as a means to full costing – possibilities and constraints for European universities. *Management: Journal of Contemporary Management Issues*, *17*(1), 33–57.

Durham, E. R., & Goldemberg, J. (1993). *Uma política para o ensino superior*. NUPES, Núcleo de

Pesquisas sobre Ensino Superior, Universidade de São Paulo.

Egea, M. T. O., & Ariza, L. R. (2005). Una metodología de gestión económica basada en el tiempo para la universidad pública. *Revista de Economía Y Empresa*, *23*(54), 113–128.

European University Association. (2008). *Financially Sustainable Universities: Towards full costing in European universities* (Working Paper). Belgium: EUA Publications 2008. Retrieved from http://dspace.utlib.ee/dspace/handle/10062/40785

Gallegos, J. D. C. (2007). Aplicación del costeo basado en actividades en las Universidades. *Industrial Data*, *10*(2), 26–29.

Inep. (2012). *Percentual do investimento direto em relação ao PIB por nível de ensino*. Brasília: Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira (INEP). [Online] Avalable: http://portal.inep.gov.br/web/guest/estatisticas-gastoseducacao-indicadores_financeiros-p.t.d._nivel_ensino.htm. (November 17, 2014).

Ismail, N. A. (2010). Activity-based management system implementation in higher education institution: Benefits and challenges. *Campus-Wide Information Systems*, *27*(1), 40–52.

Kaplan, R. S., & Anderson, S. R. (2007). *Time-Driven Activity-Based Costing: A Simpler and More Powerful Path to Higher Profits*. Cambridge: Harvard Business School Press.

Kaplan, R. S., & Cooper, R. (1998). *Custo e desempenho: administre seus custos para ser mais competitivo*. Futura.

Krishnan, A. (2006). An application of Activity Based Costing in higher learning institution: A local case study. *Contemporary Management Research*, *2*(2), 75–90.

Lima, C. M. F. (2011). The Applicability of the Principles of Activity-Based Costing System in a Higher Education Institution. *Economics and Management Research Projects: An International Journal*, *1*(1), 57–65.

Machado, N. (2002). *Sistema de informação de custo: diretrizes para integração ao orçamento público à contabilidade governamental*. 233 f. (Doutorado em Ciências Contábeis) – Faculdade de Economia, Administração e Contabilidade, Universidade de São Paulo, São Paulo.

McChlery, S., & Rolfe, T. (2004). University costing systems: a case study on value management. *Journal of Finance and Management in Public Services*, *1*(4), 67–87.

Ministério da Educação. (2011a). *Portaria SE/MEC nº 1.749 de 28 de dezembro de 2011*. Criação do Órgão Setorial do Sistema de Custos do Ministério da Educação como parte integrante da estrutura organizacional da Subsecretaria de Planejamento e Orçamento. Boletim de Serviço

Volume 21 nº 50 Suplemento. Coordenação de Documentação e Gestão de Processos e Coordenação Geral de Recursos Logísticos (December 29, 2011).

Ministério da Educação. (2014b). *Portaria SE/MEC nº 135 de 23 de janeiro de 2014*. Cria o Grupo de Trabalho (GT) encarregado de discutir as diretrizes de implantação do sistema de custos no âmbito do ministério da educação. Diário Oficial [da] República Federativa do Brasil, Brasília, (January 24, 2014).

Mitchell, M. (1996). Activity□based costing in UK universities. *Public Money and Management, 16*(1), 51–57. doi:10.1080/09540969609387909

Moghadam, A. N. (2013). Proposing an Activity-Based Costing Model in Estimating Final Cost of Iranian University Graduates in Shahid Beheshti University of Tehran. *Journal of Applied Science and Agriculture, 8*(6), 860–869.

Ortega Egea, M. T., Rodríguez Ariza, L., & López Pérez, M. V. (2007). Un modelo de cálculo de costes para el ámbito universitario: el uso del tiempo como unidad de prestación en una unidad organizativa. *Revista de Contabilidad, 10*(1), 99–132.

Peter, M. da G. A., Pessoa, M. N. M., Pinho, R., & Peter, F. A. (2003). Sistema de apuração de custos das Universidades Federais Brasileiras: uma análise crítica. In *Anais do VIII Congresso del Instituto Nacional de Costos. Punta Del Este, Uruguai*.

Reinert, C. (2005). *Metodologia para apuração de custos nas IFES brasileiras*. 92 f. Dissertação (Mestrado em Administração) - Curso de Pós-Graduação em Administração, Universidade Federal de Santa Catarina, Florianópolis.

Richardson, R. J., Peres, J. A. S. (2008). *Pesquisa Social - Métodos e Técnicas*. (3rd ed.) São Paulo: Atlas.

Schwartzman, J. (1994). *Um sistema de indicadores para as universidades brasileiras*. NUPES.

STN (2011a). *Portaria nº 157 de 9 de março de 2011*. Dispõe sobre a criação do Sistema de Custos do Governo Federal. Secretaria do Tesouro Nacional. Ministério da Fazenda. Diário Oficial [da] República Federativa do Brasil, Brasília, (October 03,2011).

STN (2011b). *Portaria nº 716 de 24 de outubro de 2011*. Dispõe sobre as competências dos Órgãos Central e Setoriais do Sistema de Custos do Governo Federal. Secretaria do Tesouro Nacional. Ministério da Fazenda. Diário Oficial [da] República Federativa do Brasil, Brasília, (October 25, 2011).

Valderrama, T. G., & Sanchez, R. D. R. (2006). Development and implementation of a university costing model. *Public Money and Management, 26*(4), 251–255.

Zubir Azhar, I., & Kamal, A. R. (2009). Managerial performance measures in management accounting practices of Malaysian institutions of higher learning. *Malaysian Accounting Review, 8*(1), 37–61.