Revista de Antropología, Ciencias de la Comunicación y de la Información, Filosofía, Lingüística y Semiótica, Problemas del Desarrollo, la Ciencia y la Tecnología

Año 36, 2020, Especial Nº

Revista de Ciencias Humanas y Sociales ISSN 1012-1587/ ISSN: 2477-9385 Depósito Legal pp 19340222U45



Universidad del Zulia Facultad Experimental de Ciencias Departamento de Ciencias Humanas Maracaibo - Venezuela

The design of the cost system in government units and its role

Rand Sabah Hussein

Republic of Iraq, Ministry of higher education and scientific research randsabah1979@gmail.com

Abstract

In order to improve the cost system, different techniques have been adopted in PSO's (public sector organizations) such as Performance and Program Costing System (PPCS), Performance Based Costing System (PBBS) and Zero-Based Costing (ZBC). The current study attempts to extend this line of reasoning as little research had been conducted in underdeveloped countries regarding implementation of "One Budgetary Approach". The findings are a fair familiarity and understanding of PPCS by financial managers and accountants following the accounting system by "public sector organizations" contributes to adopt PPCS successfully, enjoy certain benefits with adopting PPCS, and along with, certain obstacles have been explored.

Keywords: Costing, Performance, Resources, Public sector.

El diseño del sistema de costos en las unidades gubernamentales y su papel

Resumen

Con el fin de mejorar el sistema de costos, se han adoptado diferentes técnicas en las PSO (organizaciones del sector público), como el Sistema de Costeo de Rendimiento y Programa (PPCS), el Sistema de Costeo Basado en el Rendimiento (PBBS) y el Costo Cero (ZBC). El estudio actual intenta extender esta línea de razonamiento ya que se ha realizado poca investigación en países subdesarrollados con respecto a la implementación Del "Enfoque presupuestario único". Los hallazgos son una buena familiaridad y comprensión de PPCS por parte de los gerentes financieros y contadores que siguen el sistema

Recibido: 20-12-2019 •Aceptado: 20-02-2020

contable por parte de "organizaciones del sector público" que contribuyen a adoptar PPCS con éxito, disfrutan de ciertos beneficios al adoptar PPCS y, junto con, se han explorado ciertos obstáculos.

Palabras clave: Costeo, Desempeño, Recursos, Sector público

1. INTRODUCTION

Over the last two decades, there is growing amount of research on accounting in emerging economies (EEs). This might be established in a huge number of complex variables, including the expanding weights of globalization, forceful accounting reforms progressed by benefactor organizations, the extension of accounting degree programs in Western colleges for researchers from EEs, and the advancement and development of accounting journals thoughtful to accounting research in EEs. By the by, research in this area, particularly the management accounting (MA) inquire about, is still in its earliest stages (BABANE & CHAUKE, 2015).

A significant part of the research has been led in the region of financial accounting, frequently on the theme of accounting benchmarks and expert accounting standards (HOPPER AND BUI, 2016). Management accounting research in the area of EEs has been to a great extent ignored or has started to grow as of late (HOPPER, TSAMENYI, UDDIN, AND WICKRAMASINGHE, 2009). Public-sector management accounting (PSMA) inquire about has been looked into widely (BROADBENT AND GUTHRIE, 1992, 2008; GODDARD, 2010). In any case, despite the fact that these audits have given a general comprehension of the changing job of MA in the open

segment, they have not concentrated especially on EEs. It is, along these lines, imperative to assess information on PSMA in EEs and give a comprehension of the changing idea of MA rehearses in the open segment in EEs.

Our research is aimed to expand on reviews conducted by HOPPER ET AL. (2009) and ABDUL-RAHAMAN ET AL. (1997) that seeks to react by claiming that previous research conducted on management accounting have hardly been inquired about (Alawattage, Hopper and WICKRAMASINGHE, 2007). CONTAINER ET AL. (2009) led a far-reaching survey of MA look into in EEs yet did not concentrate especially on the open segment. Their survey furnished us with theoretical inspirations to order and break down MA research studies. RAHAMAN ET.AL (1997) audit paper on EEs concentrated on both open area accounting and budgetary administration investigate papers distributed before 1997 and is very near our survey point. Since 1995, a move in the improvement offers NPM changes that have influenced the open part in EEs altogether (DUVAL, GENDRON, AND ROUX-DUFORTC, 2015).

For past few decades, the budgetary frameworks adopted in both developing and developed nations have been criticized by practitioners and well-known scholars in overall government institutes. Genuine goal of these analysis was to search for improved instruments which that can control the Budgetary assets of the nation in a productive manner. The present conventional "detail spending plan" which is being utilized in their Budgetary practices, has pulled in

serious analysis from numerous specialists in light of the fact that, as indicated by them, this framework is not helping any administration to use the financial limit as a way to create productivity and take choices in regards to assignment of open assets. According to this methodology, numerous financial Costs are given each monetary year with no difference are included for the following Cost years. PPCS was acquainted all together to fix this issue and increment rationality components during the time spent on budgetary decision making.

Therefore, PPCS, act as a road map for accomplishing desired goals to utilize the available resources in effective manner. However, it will assist in increasing the government services, for instance quality controls. Additionally, it intends to contribute by identifying the problems faced, during the implementation phase and to get rid of weaknesses identified in the planning projects by providing their solutions. A large research gap is missing in this field to examine and document the implementation of PPCS in developing countries as there are limited researches in case of Iraq as per the researcher knowledge. The current research extends this line of reasoning as few had been conducted research in this underdeveloped nations regarding implementation of "One Budgetary Approach" which is known as "Program and performance Costing System (PPCS)".

Change in management accountant's functions and roles:

Based on the seminal work presented by SIMON. KOZMETSKY, GUETZKOW AND TYNDALL (1954) explored the role of management accountants' (MA). In which they proposed 3 different jobs for accountants: scorekeeping, problem-solving and attention directing. The data needs of business counterparties the management accountants could impact their job in the firms (SIMON ET AL., 1954). CONTAINER (1980) proposed two prime examples of executive's Service-aid the accountants: accountants and bookkeepers.

Scholastic writing has reasoned that the accounting model, which organizes the generation of occasional budgetary system, best represents the conventional role of the management accountants in their firms (FRIEDMAN AND LYNE, 1997; MOURITSEN, 1996; BYRNE AND PIERCE, 2007). Additionally, previous research studies have indicated that administration bookkeeping archetype example (GRAHAM, DAVEY-EVANS AND TOON, 2012) have been portrayed with various names, for example, "analyst"(VAIVIO AND KOKKO, 2006; BYRNE AND PIERCE, 2007), "accountant" (BURNS AND BALDVINSDOTTIR, 2005; JÄRVENPÄÄ, 2007) and even "corporate police" (YAZDIFAR AND TSAMENYI, 2005). The role of accountant looks like intently that of a financial accountant (PIERCE AND O'DEA, 2003) with accentuation on revealing, control and complaint aspects of the accounting functions (BYRNE AND PIERCE, 2007).

However, the managerial bookkeepers are progressively expecting the role of progress operators in their respective organizations. For example, RUSSELL ET AL (1999, p.41) asserted that "management bookkeepers aren't simply overseeing change: they are starting change". BINNERSLEY (1997, p. 36) contends that managerial bookkeepers

Need to perceive and encourage the change occurring as opposed. They have the aptitude to apply thorough estimation discipline, capacity to create frameworks and an interesting perspective over the business. SHARMA (1998, p. 24).

Concurs that administration bookkeepers will "be called upon to work as directors of business worth, and specialists of progress." Similarly, BARBERA (1996) guaranteed that "new bookkeepers are change operators and then some substantially more." Although there is solid help for bookkeepers' proactive inclusion in change, ZAROwin (1997:38) uncovered that "the job is viewed as one of help as opposed to including proactively with respect to the board accountants."

Management bookkeepers are providing strategic assistance to organizations. As Barbara points out (1996), the studies have seen the modern roles or elements of an administration bookkeeper as: business investigator, inner expert or counsel (or 'colleague'), change operator, data supplier (or information laborer' the 'center point' of information), pioneer of as well as participator in cross utilitarian groups, originator and supervisor of data frameworks, architect and controller of

execution estimation frameworks, instructor, guide or teacher, and Internal and administrator of multifaceted nature.

The role of management accountant has been portrayed with more dominant emphasis on administration, as opposed to data arrangement. Contemporary bookkeeper portrayed as: "business analyst" (JÄRVENPÄÄ, 2007), business-oriented role of management accountants (BALDVINSDOTTIR ET AL., 2009a), business controller and partner, (GRANLUND & LUKKA, 1997) and change agent (BURNS & BALDVINSDOTTIR, 2005).

Management bookkeepers are found to be effective in key decision-making for strategic management (LAMBERT AND SPONEM, 2012; MOURITSEN, 1996). The Institute of Management Accounting (IMA) research requested that administration bookkeepers characterize their situation in the different organizations. In this, none of the respondents characterized themselves as "the executives' bookkeepers". 29% of respondents worked in Finance, 33% worked in Accounting and 28% said something else (RUSSEL, ET AL. 1999). The accompanying statement endeavors to clarify why: The most well-known explanations behind individuals, reported that they work in 'fund', as opposed to bookkeeping, it relates with the positive implications that respondents have of money and negative meaning they have of bookkeeping. Fund is 'forward-looking', while at the same time accounting is in reverse looking. Fund is comprehensive. Accounting alludes to charge and credits.

Essentially, research conducted in UK, it was discovered that

In certain organizations, bookkeepers are changing their activity titles, turning out to be 'business investigators' rather than corporate controllers BARBERA (1996: 53). (BURNS ET AL.1999: 29) found in their research, the jobs of the board bookkeepers extended to incorporate giving master exhortation, group administration, initiative in utilizing factual/scientific methods, the structure and the executives of data frameworks, the plan and control of execution estimation frameworks, giving data, being educators, guides, investigators, inward experts, mediators and directors of multifaceted nature. In addition, the aftereffects of the examinations led in the US and UK generally found that, inexorably, the executive bookkeepers devoted more energy as "inward specialists", are effectively associated with basic decision making.

And "work intimately with their 'client' to give the correct data and assist in utilizing better choices" (RUSSELL ET AL, 1999: 40). Temporal direction of the board bookkeepers positions to the present and future, rather than accentuating past and verifiable data (GRANLUND AND LUKKA, 1998; JÄRVENPÄÄ, 2007), requesting more prominent adaptability and practicality from the executives bookkeepers (PIERCE AND O'DEA, 2003). The colleague job is heaps of collaboration and participation.

Research conducted by SHARMA (1998) reported that, a study of 140 assembling firms in Australia, various activities on the executives bookkeeping were observed. Therefore, respondents accepted that administration bookkeeping methods, for instance, planning for arranging and control, difference investigation, capital

planning, quantifiable profit will keep on being utilized and given an elevated level of accentuation in Australia fabricating firms. In addition, SHARMA (1998, p24) contends that "administration will keep on putting accentuation on monetary execution measures, comparative with non-budgetary measures".

SHARMA (1998) guaranteed that future administration bookkeeping creates territories that includes an range of cross-practical controls, for example, execution the executives (for example creating key monetary and non-budgetary markers) resource the board (for example dealing with an item through its life cycle), business control the board (for example corporate administration and interior control structures), natural administration (for example representing the condition), financial administration (for example action based management), scholarly capital administration (for example estimating and overseeing representative fulfillment), Information Management (for example executing and producing an incentive from web based business and EDI), quality administration (for example actualizing TQM inside and association and overseeing quality improvement), and vital administration (for example esteem chain examination for surveying upper hand).

2. METHODOLOGY

This research is based on two data collection sources: primary and secondary data. By designing questionnaire, we collected primary

data, whereas, secondary data has been collected from the Journals, books, internet and libraries. Questionnaire based on 36 questions was sent to the accountants of 47 public organizations during the year 2017-18. The questionnaire had 2 main divisions: Introductory questions as warm up questions for establishing profile (e.g. Experience, Degree, Area, Organization, and knowledge about adoption of Costing system etc.) and second part consisted of questions for measuring the attitude of the selected participants towards the following: (1) Familiarity with PPCS (2) Degree of Contribution in adopting PPCS (3) Implementation of PPCS (4) Obstacles faced by financial managers and accountants in adopting PPCS. A five-point Likert- scale was used to characterize the attitude as: Highly agree to highly disagree. Purposive sampling was used for selecting sample. 45 questionnaires were returned out of 70, with 84 % response rate.

Dealing with Validity and Reliability, with the help of SPSS software, researcher measured value of "Cronbach's Alpha" as 0.8 therefore the test is considered as valid in terms of Reliability. Whereas, for Validity, initially pilot testing was conducted by sending 18 questionnaires to respondents, the same questionnaires were sent again after 10 days. This research shows the uniform results for the interval of 10 days that indicated the validity of survey instrument.

Table 1

Items	(Cronbach's Alpha)
36	0.8

3. RESULTS and DISCUSSION

Table2 provides the information about respondents, that most of the participants were Accountants and financial managers that had bachelor's degree and specialized in accounting that indicates that they are qualified enough to answer the questions. Whereas, table (2) represents that the participants have good experience that shows around (49.7 %) had experience in between 5 to 10 years.

Table 2: Demographic about participants

Variables	Particulars	Number of Respondents	Percentage to Total
Degree	Intermediate Bachelors Master Ph.D. Total	14 27 4 1	30.4 58.7 8.7 2.2
Major	Accounting Finance Management Professional Qualification Other Total	29 10 3 1 3 46	63.0 21.7 6.5 2.2 6.5 100.0
Years of Experience	Below 5 years 5-10 years Above 10 years Total	12 24 10 46	26.00 52.2 21.8 100.0
Cost Adopted	Line-Item Cost PPCS PBBS ZBB Total	37 7 2 - 46	80.4 15.2 4.4 - 100.0

Table 3 represents the respondent's attitude Financial Managers & Accountants (FMA) about Program and Performance Costing System (PPCS) familiarity, the analysis depicts that the statement No (4) shows the highest mean, that sheds light on the ability and qualification to prepare PPCS as the mean was a bout (2.92). Whereas, question No (2) results in the lowest mean that relates to (3.21) concerning the level of knowledge and understanding about the Program and Performance Costing System (PPCS). Thus, it is concluded for the statements (1-4) the average mean was about (3.26) and that portrays there is a fair awareness of this Cost format among the respondents. Accountants and Financial managers in the selected public sector organizations in Al Kharj region, hence more training and development is recommended to enhance the familiarity with Program and Performance Costing System (PPCS). Value 12.89 is significant which proves, that hypothesis formulated is confirmed.

Table 3: Familiarity with Program and Performance Costing System (PPCS)

Statements	Mean	S.D	t	Sig.
Understanding and knowledge	2.99	.59	7.30	.00
regarding the Program and				
Performance Costing System (PPCS)				
Features awareness of Program and	4.12	.70	5.26	.00
Performance Costing System (PPCS)				
Understanding the difference between	3.23	.60	5.45	.00
Traditional Costing and PPCS				
Qualification and ability to prepare	4.12	.58	6.87	.00
PPCS				
Average	4.41	.29	13.99	.00

7.3 Degree of Contribution of the Accounting System to Adopt PPCS. Table 4 presents the attitude of respondents Financial Managers & Accountants (FMA) relates to the degree of contribution of the present accounting system in the selected public organizations to adopt PPCS, The results showed that the statement No (7) showed highest mean, which is concerning to the effective accounting reporting system, whereas the statement No (9) shows the lowest mean was about (3.42) measuring the attitude of the selected (Financial Managers & Accountants) relating to providing an enough staff with appropriate administrative and accounting skills. Hence, it can be concluded based on the overall average mean which was about (3.70) for the statements (5-9) that there is a tendency towards the side of highly agreeing in regards to the degree of contribution of the prevailed accounting system followed by the selected public sector organizations in Al Kharj region to adopt PPCS.

Considering T value 7.720 the hypothesis is confirmed. Therefore, it can be concluded that the accounting system followed by PSO's (public sector organizations) contributes to adopt PPCS successfully.

4. CONCLUSION

This study has set up specific aims to accomplish for example analyzing the familiarity and understanding degree of PPCS by Budgetary chiefs and bookkeepers working in the open part associations, estimating the commitment of the bookkeeping framework followed by open segment associations to receive PPCS effectively, featuring the advantages that could be acquired while embracing PPCS, and investigating the specialized difficulties that can be experienced when actualizing Program and Performance Costing System PPCS in the open segment associations.

However, developing and developed nations are steadily moving towards adopting PPCS, for most nations the usage of PPCS is still in its beginning times of improvement. Subsequently, investigating the specialized difficulties and issues can aid fruitful progress to Program and Performance Costing System and can carry radical changes to structure and organization of the administration spending plans and to budgetary decision-making reforms.

We believe that, they are a few nations who had accomplished a positive outcome by adopting PPCS, while a few countries are still in the process to adopt it. Along these lines, we recommend moving to another framework for example PPCS where we can discover a response for those inquiries where the customary planning framework neglected to reply, either in basic leadership process, monetary government arranging, checking uses and exercises.

The previous aftereffects of overview acquired from 46 respondents (Financial Managers and Accountants) safely find that notwithstanding the fair of commonality and the issues in usage of PPCS in open division associations of Al Kharj, there is a striking help

from the respondents for PPCS as an unrivaled methodology for reserving the civic funds. PPCS give a measure device to catching up and assessing the presentation and build up a feeling of the different managerial levels answerable for "open use". Respondents saw PPCS as a superior way to deal with contribute in improving correspondences between administrative levels. These advantages delineated in Table 5 appear to be acceptable to approve the execution of PPCS in open area associations in Al Kharj district.

Looking to the level of commitment of the predominant bookkeeping framework to receive PPCS in the chose open associations in Al Kharj locale, it is seen that 75 percent of respondents accepts that the present bookkeeping framework gives information and data expected to basic leadership precisely and rapidly and has a compelling controlling/announcing frameworks, and controlling the way toward spending. It is likewise discovered that 69 percent of respondents were in see that an enough staff with fitting authoritative and accounting abilities are given. PPCS can be effectively received in open division if a legitimate preparing and capability for staff to handle arrangement of PPCS is given to bargain the required or required accounting framework, evaluating programs results or execution markers and a satisfactory help by the top administration is given to actualize PPCS.

REFERENCES

ABDUL-RAHAMAN, A. S., GALLHOFER, S., HASLAM, J., & LAWRENCE, S. 1997. **Public sector accounting and**

- financial management in developing countries: a critical assessment of the literature. Asian Review of Accounting.
- ALAWATTAGE, C., HOPPER, T., & WICKRAMASINGHE, D. 2007. "Introduction to management accounting in less developed countries". Journal of Accounting & Organizational Change.
- ALAWATTAGE, C., HOPPER, T., WICKRAMASINGHE, D., AWIO, G., LAWRENCE, S., & NORTHCOTT, D. 2007. "Community-led initiatives: reforms for better accountability?". Journal of Accounting & Organizational Change.
- ALAWATTAGE, C., HOPPER, T., WICKRAMASINGHE, D., KHOLEIF, A. O., ABDEL-KADER, M., & SHERER, M. 2007. "ERP customization failure". Journal of Accounting & Organizational Change.
- ALAWATTAGE, C., HOPPER, T., WICKRAMASINGHE, D., VAN HELDEN, G. J., & TILLEMA, S. 2007. "Public sector performance measurement in developing countries". **Journal of Accounting & Organizational Change.**
- ASSAD, M. J., & GODDARD, A. R. 2010. "Stakeholder salience and accounting practices in Tanzanian NGOs". **International Journal of Public Sector Management.**
- BABANE, M. T., & CHAUKE, M. T. 2015. "Cross-border Language Harmonization: A Case of Xitsonga (South Africa) and Shangani (Zimbabwe)". **Journal of Sociology and Social Anthropology.** Vol. 6, No 3: 435-440.
- BROADBENT, J. 1999. "The state of public sector accounting research". Accounting, Auditing & Accountability Journal.
- BROADBENT, J., & GUTHRIE, J. 1992. "Changes in the Public Sector: A Review of Recent"Alternative"Accounting Research". Accounting, Auditing & Accountability Journal. Vol. 5, No 2: 0-0.
- BURNS, J., & BALDVINSDOTTIR, G. 2005. "An institutional perspective of accountants' new roles—the interplay of

- contradictions and praxis". **European Accounting Review**. Vol. 14. No 4: 725-757.
- BURNS, J., & BALDVINSDOTTIR, G. 2005. "An institutional perspective of accountants' new roles—the interplay of contradictions and praxis". **European Accounting Review.** Vol. 14, No 4: 725-757.
- BURNS, J., & VAIVIO, J. 2001. "Management accounting change". **Management accounting research.** Vol. 12, No 4.
- BURRITT, R. L., & SCHALTEGGER, S. 2010. "Sustainability accounting and reporting: fad or trend?". Accounting, Auditing & Accountability Journal.
- BYRNE, S., & PIERCE, B. 2007. "Towards a more comprehensive understanding of the roles of management accountants". **European accounting review.** Vol. 16, No 3: 469-498.
- BYRNE, S., & PIERCE, B. 2007. "Towards a more comprehensive understanding of the roles of management accountants". **European accounting review.** Vol. 16, No 3: 469-498.
- CHAN, J. L. 2003. "Government accounting: an assessment of theory, purposes and standards". **Public Money & Management.** Vol. 23, No 1: 13-20.
- CHENHALL, R. H., & MORRIS, D. 1986. The impact of structure, environment, and interdependence on the perceived usefulness of management accounting systems. Accounting Review: 16-35.
- FLEISCHMAN, R., & TYSON, T. 2006. The history of management accounting in the US. Handbooks of management accounting research. 2: 1071-1089.
- GRAHAM, C., HOPPER, T., TSAMENYI, M., UDDIN, S., & WICKRAMASINGHE, D. 2009. "Management accounting in less developed countries: what is known and needs knowing". Accounting, Auditing & Accountability Journal.
- GRAHAM, C., HOPPER, T., TSAMENYI, M., UDDIN, S., & WICKRAMASINGHE, D. 2009. "Management accounting in

- less developed countries: what is known and needs knowing". Accounting, Auditing & Accountability Journal.
- GRANLUND, M., & LUKKA, K. 1998. "It's a small world of management accounting practices". **Journal of management accounting research.** Vol. 10, No 153.
- HALL, M. 2010. "Accounting information and managerial work". Accounting, Organizations and Society. Vol. 35, No 3: 301-315.
- HAYES, D. C. 1977. The contingency theory of managerial accounting. Accounting review: 22-39.
- HIRST, M. K. 1981. Accounting information and the evaluation of subordinate performance: a situational approach. Accounting Review: 771-784.
- JÖNSSON, S. 1998. "Relate management accounting research to managerial work"! **Accounting, Organizations and Society.** Vol. 23, No 4: 411-434.
- LAMBERT, C., & SPONEM, S. 2012. "Roles, authority and involvement of the management accounting function: a multiple case-study perspective". **European Accounting Review.** Vol. 21. No 3: 565-589.
- MIR, M. Z., & RAHAMAN, A. S. 2005. "The adoption of international accounting standards in Bangladesh". Accounting, Auditing & Accountability Journal.
- MOURITSEN, J. 1996. "Five aspects of accounting departments' work". **Management Accounting Research.** Vol. 7, No 3: 283-303.
- MOURITSEN, J. 1996. "Five aspects of accounting departments' work". **Management Accounting Research.** Vol. 7, No 3: 283-303.
- MUNRO, R., & MOURITSEN, J. (EDS.). 1996. Accountability: Power, ethos and the technologies of managing. Cengage Learning Emea.
- PARKER, L., GUTHRIE, J., MILNE, M., & BROADBENT, J. 2008. "Public sector to public services: 20 years of "contextual"

- accounting research". Accounting, Auditing & Accountability Journal.
- SIMON, H. A. 1954. Centralization vs. decentralization in organizing the controller's department: A research study and report (No. 4). Controllership Foundation.
- SIMON, T. J. 1997. "Reconceptualizing the origins of number knowledge: A "non-numerical" account". **Cognitive development.** Vol. 12, No 3: 349-372.
- TSUI, J. S. 2001. "The impact of culture on the relationship between budgetary participation, management accounting systems, and managerial performance: An analysis of Chinese and Western managers". **The international journal of accounting.** Vol. 36, No 2: 125-146.
- VAN HELDEN, J., & UDDIN, S. 2016. Public sector management accounting in emerging economies: A literature review. **Critical Perspectives on Accounting.** Vol. 41: 34-62.
- WICKRAMASINGHE, D., & ALAWATTAGE, C. 2012. Management accounting change: approaches and perspectives. Routledge.





Revista de Ciencias Humanas y Sociales

Año 36, Especial N° 26 (2020)

Esta revista fue editada en formato digital por el personal de la Oficina de Publicaciones Científicas de la Facultad Experimental de Ciencias, Universidad del Zulia.

Maracaibo - Venezuela

www.luz.edu.ve

www.serbi.luz.edu.ve

produccioncientifica.luz.edu.ve