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### **Capacity Diagnostics for Advancing Higher Education in the Developing World: A Case Study from the Republic of Panama**

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#### **Abstract**

The past decade of global development has witnessed extensive use of capacity diagnostics for improving the systems and skills needed for national, institutional and organizational development. Little of this experience, however, has been applied to higher education. This paper presents a model for adapting capacity diagnostics to creation of tools for (1) documenting existing resources in higher education institutions or academic areas, and (2) detailing perceptions in the labor market of current assets and gaps to facilitate better planning for and development of required curricular, research and personnel capacities. This model is illustrated with a case study from the Republic of Panama where a North-South research partnership between the National Secretariat for Science, Technology and Innovation (SENACYT) and Tulane University applied the diagnostic to an assessment of the country's higher education and research in the social sciences. Findings suggest significant discrepancies between the present academic offer and the skills and knowledge required by the productive sector; they also highlight specific institutional and policy

adjustments that would strengthen the university system overall and preparation in the social sciences at all levels. This paper refers to the Panama case in a broader discussion of how this research approach may be applied more broadly to inform policy for countries' higher education systems, particularly in developing regions. As higher education becomes increasingly important for emerging economies' competitiveness, potential for adoption of this model worldwide is considerable.

**Keywords:** Higher education, assessment, capacity, diagnostic, labor market, developing country, North-South, Latin America, Panama

## I. Introduction

The past couple of decades in global development have witnessed extensive use of capacity diagnostics for mapping and analyzing the systems and skills needed for national, institutional and organizational development. International organizations such as the Organization for Economic Cooperation and Development (OECD), World Bank and numerous United Nations (UN) groups, along with many bilateral agencies, have invested significantly to develop and apply tools and technologies intended to assist with building national capacities across a range of technical, functional and structural areas. These diagnostics are used for the design and implementation of improvements to the sector, field or institution in question. They are also used as benchmarks and baseline references for any follow up monitoring and evaluation (OECD 2006, UNDP 2008, World Bank 2009). Ironically, however, little of this experience has been applied to higher education.

This paper presents a model for adapting capacity diagnostics to create tools for (1) documenting existing resources in higher education institutions or academic areas, and (2) detailing perceptions in the labor market of current assets and gaps to facilitate better planning for and development of required curricular, research and personnel capacities.

The model is illustrated with a case study from the Republic of Panama where the National Secretariat for Science, Technology and Innovation (SENACYT) has conducted a study with Tulane University to apply the diagnostic to an assessment of the country's higher education and research in the social sciences. Findings from the SENACYT-Tulane project suggest significant discrepancies between the present academic offer and the skills and knowledge required by the productive sector; they also highlight specific institutional and policy adjustments that would strengthen the university system overall and preparation in the social sciences at all levels. This paper also presents the potential for this higher education diagnostic to serve as a tool for academia-labor market gap analysis, which has more far-reaching implications for countries and states in terms of competitiveness at national and global levels—particularly for developing regions. As higher education becomes increasingly important for developing economies' progress and competitiveness, the possibilities for application of this model worldwide are considerable.

Following this introduction, the paper offers a brief review of capacity definitions and exploration of capacity diagnostics as development tools. It then presents the adaptation and utilization of this concept in the Panamanian SENACYT-Tulane research project. It

concludes with a discussion of how this methodology may be adapted to other situations—particularly in developing countries—for assessing higher education and research capacity as a means to developing strategies for productive long-term national development.

## **II. Capacity: Definition and Diagnostics**

As a constructive initial step toward national or local capacity development in any area or sector, international organizations, as well as academic institutions, increasingly employ capacity assessment diagnostics. While there are many particular definitions of “capacity,” in this context it broadly refers to the ability of individuals, organizations, governments and societies, overall, to manage their affairs to set and achieve specific objectives over time. “Capacity development,” as a result, refers to the process by which the requisite skills and abilities for meeting these objectives are created, strengthened and maintained (OECD 2006, UNDP 2008, World Bank 2009). Capacity assessments are diagnostic tools that help to map more precisely the existing skills in a country, sector or area along with the existing needs for specific skills required by the public and private sectors to identify gaps and opportunities for capacity development. This type of diagnosis then serves as a basic reference for decisions and activities undertaken to strengthen competencies in the area, institution or sector in question as well as for follow-up monitoring and evaluation. In recent decades, international organizations and universities worldwide have published extensively on the topic and created a range of tools for application in different sectors (UNDP 2008, JICA 2008, WHO 2006, EuropeAid 2005, VPP 2001, Grindle and Hilderbrand 1997).

Using this type of diagnostic facilitates the systematic documentation of existing resources in a technical or sectoral area. At the same time, it documents perceptions of needed capacities in the same area for better planning, organization and policy making related to the development of those capacities (UNDP 2008). Its application to public health (WHO 2006), the tropical forest sector (Junkin 2008), the administration of non-governmental organizations (VPP 2001), international cooperation projects (JICA 2008), the operationalization of international agreements (EuropeAid 2005) and the local governance (UNDP 2010)—among many other examples—demonstrates the versatility and usefulness of this type of diagnostic.

The concept of capacity development has also been linked closely with the concept of competitiveness. Initially, it was the private sector that studied capacity extensively in terms of productivity and competitive advantage (Porter 1985; Hamel and Heene 1994). Since then, however, the relevance of the concept has been transferred to national and international development. Authors such as Sen (1999), Blumenthal (2003) and Morgan (2006) have indicated how the same concept of creating and strengthening capacities relates to the development of functional, competitive societies. The first step to building and strengthening capacities requires identifying which capacities already exist at institutional, organizational and individual levels for achieving a specific objective and which need to be developed. (UNDP 2008). As alluded to above, much of this capacity oriented technology and work was developed initially within the international cooperation context. Nevertheless, as the concepts have filtered into the mainstream, they have been adopted and adapted by many national governments and organizations as well toward similar ends.

### III. The Panama Case Study

#### Background

Social sciences in Panama have a relatively long history. Academically, this history is concentrated principally in the University of Panama (UP) and in the Catholic University of Santa Maria la Antigua (USMA), the two oldest and most established universities in the country. The development of the social sciences as an area of study advanced considerably with the creation of the Center for Latin American Studies, (CELA) in 1976, and the opening in 2009 of FLACSO-Panama, the Panama office for the Latin American School of Social Sciences (FLACSO, for its acronym in Spanish), the region's primary institution for the promotion and study of the social sciences (CELA 2011, FLACSO 2011). These centers offer physical and virtual spaces that serve to bring academics together, provide publishing opportunities and systematize the knowledge created in this area.

In addition to these efforts, a national strategic plan was designed in 2005 to develop science, technology and innovation that included the social sciences and incorporated in its objectives a program to develop the sector. A more recent national plan for developing scientific capabilities, Panama's *National Strategic Plan for Science Technology and Innovation 2010-2014* (*PENCIYT 2010-2014*), includes more information regarding existing resources for the social sciences in the country and specific objectives for the development of the field. At the same time, budgets and grants dedicated exclusively to the development of projects and research focused on different aspects of the social sciences have been created within Panama's National Secretariat for Science, Technology and Innovation (SENACYT). This has promoted more publication on the status of the social sciences in Panama (SENACYT 2010, Gandásegui 2011), but even so the country still lacks data in many areas critical to the development of the overall field.

*PENCIYT 2010-2014*, in its National Program for Science, Technology and Innovation for the Development of the Social Sciences, highlights the need to strengthen higher education and research of social sciences in Panama. However, at the time of its launch, the country lacked a complete inventory of the existing social sciences-oriented college programs and research institutes, as well as data on the kind of capacity required by the labor market in the area of the social sciences.<sup>1</sup> Effectively investing in and advancing the national goal of developing the social sciences requires quantitative and qualitative information on the current status of the social sciences in Panama, corresponding strengths and weaknesses in different areas and disciplines, and the related knowledge and skills required in the labor market. With such data and information, the government and the private sector can better assess allocation of resources for the promotion of the social sciences and, ultimately, national development.

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<sup>1</sup> Quoting UNESCO, *PENCIYT 2010-2014* generally defines "social sciences" as the disciplines that are interested in people, their culture, their environment; mainly includes the following: administrative sciences, behavioral sciences, political sciences, communications, Law, economics, education and sociology.

This project began in 2014 as a joint initiative of SENACYT and Tulane University in the United States, following the release of *PENCYT 2010-2014*. Tulane has a long, if uneven, history of cooperation, research and programming in Panama. Panama also has a relatively large number of Tulane alumni in the country (from undergraduate and graduate programs) with many of these alums holding prominent positions in various national public and private sector entities. Thus, Tulane has a certain degree of brand recognition in Panama, in both public and private sectors. This investigation came about largely because of the involvement of a Tulane professor in the *PENCYT 2010-2014* development process and Tulane's interdisciplinary experience with global development projects.

SENACYT, as indicated previously, is Panama's National Secretariat of Science, Technology and Innovation, the autonomous government entity responsible for producing and implementing scientific policy and research. It is similar in concept to the US National Science Foundation and was founded in 1997 with a mission to convert science and technology into instruments for Panama's sustainable development. SENACYT works with national and international universities and research institutions to strengthen, support and promote development of science, technology and innovation for raising national productivity, competitiveness and modernization in public and private sectors, academia and the general population. It was the entity responsible for developing and publishing *PENCYT 2010-2014* and the updated version of this plan for 2015-2019. SENACYT is the primary source for government-funded research and national scholarships at all levels (SENACYT 2016). It works with a current annual budget of around US\$35 million, of which less than US\$2 million goes to financing new research. The full SENACYT budget represents less than 0.02 percent of Panama's gross domestic product (GDP)—far lower than the global average for developed countries and even lower than the more productive Latin American countries that dedicate around 0.07 percent to research and development (R&D). In the 20 years since its inception, SENACYT has sponsored 69 completed research projects across a range of subjects (Gittens 2015). Given its budget, most of the SENACYT research grants are relatively small. The project discussed here received US\$60,000 from SENACYT and has a total budget of less than US\$100,000.

In 2014, SENACYT entered into a two-year partnership with Tulane, the goal of which was to produce a final "Capacity Assessment of Higher Education and Research in the Social Sciences in the Republic of Panama." SENACYT provided the funding for the project and Tulane provided the principal investigator, research design and institutional experience from past research in developing countries to be applied to the implementation and data analysis. The project's primary aim was to carry out a general capacity assessment of higher education and research in the social sciences in Panama to begin to fill the existing data gap on the status of the social sciences in the country. Additionally, the project sought to generate information on which capacities within the wide range of those related to the social sciences are most important for the country with regard to developing competitiveness.

### **Research Design and Methods**

The basic objectives of this project were (1) to understand which resources and capacities currently exist in Panama for higher education and research related to the social sciences;

(2) to understand the needs for knowledge related to the social sciences as they exist in the public and private sectors of the labor market; and (3) to determine the gaps between the existing and required capacities, mainly to inform policymaking and institutional decision making. The existing resources and capacities studied were conceptualized in terms of numbers and types of qualified professionals; existing institutions and organizations; the national academic offer and related degrees; the national legal framework; research programs; and national publications, among other factors. Needs in the labor market were studied and assessed through interviews and surveys that sought to identify and evaluate specific skills and competencies related to university study in the social sciences.

The research used a mixed methods approach that combined qualitative and quantitative inputs. The qualitative inputs were based on a thorough analysis of documents and secondary data, along with the information collected from a series of key informant interviews. In both cases, the UNESCO definition for the range of social sciences referenced by *PENCYT 2010-2014* was used.<sup>2</sup> The sample frame for the academic and research institutions to be included in the interviews was limited to the list of institutions approved by the Ministry of Education of the Republic of Panama (MEDUCA 2011).

The document and secondary data analysis compiled and reviewed existing information on the status of the social sciences in Panama. Online data on university programs, research, publications, labor market participation, and academic activities related to the social sciences (such as conferences, workshops and other scholastic events) was analyzed from the universities and research centers in Panama with current social science programs and degrees; from the Contraloría de la República de Panamá (the National Statistics Office), SENACYT and other pertinent government institutions; and from national and international organizations in Panama with activities and publications related to the different areas linked to the social sciences. The purpose of this phase of the investigation was to create a more complete and detailed national context of the current state of the social sciences in Panama. The information generated contributed to an inventory that was produced and published within the course of the project.

The key informant interviews used a purposive sample of 20 key actors representing universities, research centers, private sector companies and active governmental and non-governmental entities. Both open and closed questions were included in the interviews. The closed questions were used to fill information gaps encountered in the document and secondary data analyses; the open questions were used to better articulate perceptions of key issues related to the development of the social sciences. This data also contributed to the inventory produced and provided inputs for designing the large-scale survey questionnaire.

The quantitative input was based on the data processed from a large-scale survey with over 500 participants from a universal population of approximately 3,000 institutions. The survey was directed toward users (or employers) of capacities and knowledge related to the

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<sup>2</sup> This definition includes disciplines that relate to people, their culture and their environment, specifically the following areas: administrative sciences, behavioral sciences, political sciences, communications, law, economics, education and sociology.

social sciences (organizations that require skills in administrative sciences, behavioral sciences, political sciences, communications, law, education and sociology, for example).

The sample frame of this population was made up of the universities and research centers with social science programs, government ministries, non-governmental and international organizations in Panama's City of Knowledge<sup>3</sup> that operate in the specified range of areas related to the social sciences, and member organizations of the various chambers of commerce and professional associations whose activities are related to areas comprising the social sciences. The survey used mainly closed questions and a stratified random sampling methodology. The objective of this survey was to measure labor market perceptions concerning types of existing and desired degrees; academic degree areas of over- and under-representation; levels of satisfaction with graduates' technical, analytical and interpersonal capacities; and research needs. A team of Tulane and local university professors designed the survey and managed the training and oversight for its implementation. An international market research company based in Panama was responsible for the survey implementation. The data collected from the survey was tabulated and processed in SPSS (Statistical Package for the Social Sciences). Levels of analysis included descriptive statistical reviews to detect norms and tendencies related to strengths, weaknesses and identified priorities. Correlations were also run to determine particular perceptions within and among the different groups of participants (academic institutions, governmental and private sector entities; national and international organizations; and small, medium and large scale entities, for example).

Initially, the project envisioned working with a local university team for data collection and processing in all phases of the research—document analysis, secondary data review, key informant interviews and the labor market survey. All major local universities with active social sciences programs were approached, but none felt they had the available capacity to participate in the project—in spite of the fact that funding was available within the project for compensating local university contributions. Reasons for this included limited faculty experience with the research methods utilized in this project; lack of faculty and student time for dedication to research endeavors; and inadequate institutional incentives to compensate for either of the aforementioned issues. Additionally, attempts were made to recruit other local non-governmental and academic institutions (among them, the Panamanian branch the Latin American Social Sciences Institute (FLACSO, a prominent regional actor in social science education and research) for participation in the project but, again, none felt they had the necessary human resources for involvement, for many of the reasons stated above with regard to the local universities. This dearth of local investigative capacity presented a stumbling block for the project and is, itself, indicative of certain major capacity gaps brought to light by this project.

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<sup>3</sup> The City of Knowledge in Panama is a human development park that operates in the parameters of a former US military base in the Canal Zone and houses an important collection of government offices, NGOs, international organizations, academic programs and businesses.

## Products and Results

Upon completion of the SENACYT-Tulane project, the final products from this research include the following:

1. A national inventory (with digital files) of i) the academic offer—higher education programs (undergraduate and graduate), by institution, in the range of disciplines that comprise the social sciences in universities approved by the Ministry of Education—and their degree requirements; ii) the research centers in the country that operate in areas related to the social sciences and their areas of concentration; iii) the number of professors and researchers associated with universities and research centers with master's and doctorate degrees in the areas of the social sciences, iv) an estimate of the number of students actively studying in social science disciplines; and v) the pertinent national publications in areas related to the social sciences;
2. A quantitative study based on the survey data reporting on perceptions of the productive sector regarding existing capacities in the areas of the social sciences and those that need to be developed;
3. A final report on *The Social Sciences in Panama: Academic Supply versus Labor Market Demand*, which details the findings of the research for widespread dissemination. This report compares existing capacities and resources in Panama for the social sciences with the labor market needs of the public and private sectors and offers recommendations on specific priorities and areas of concentration for developing national capacity in the social sciences;
4. Presentations at various national, regional and international conferences;
5. Dissemination of results through two newspaper articles and several academic journal articles (published in English and in Spanish).

Major findings from the first phase of the investigation and the inventories produced show a growing academic “supply” of social sciences degree programs in the private universities—almost double the number offered in the public universities. This tendency is indicative of the rate at which the private university sector is expanding in general, especially in non-technical areas and at the Master's level. Private higher education is concentrated in the areas of business, law and education, all areas requiring little in the way of expensive overhead or infrastructure. Public university social science degrees are also heavily concentrated in the same three areas but offer programs in a range of other fields, too, such as anthropology, sociology, public policy and psychology, for example. Still, little is available for archaeology, criminology, demographics, environmental studies, public administration and international relations. Of the total of over 1,000 university social science degrees registered in Panamanian higher education (public and private), over 75% correspond to business, law and education. This investigative phase also documented over 50 registered social science research centers in the country, though few of these are truly active with consistent production of research, publications and academic events. The importance of the social sciences overall was confirmed by the fact that 72% of all university graduates complete degrees in one or another of the areas associated with the



social sciences. A similar statistic describes the proportion of professors available in the social sciences compared with other fields.

The findings from the final large-scale survey phase of the research covered a range of topics. The productive sector generally confirmed the over-concentration of degrees and graduates in the areas of business, law and education, but also acknowledged those to be the largest areas of demand for higher education credentials. There was also a noted call for more graduate level instruction, particularly at the doctoral level. Labor market satisfaction with technical, analytical and interpersonal skills and capacities was, on average, quite low. Using a scale of 1-6 with 1 corresponding to the lowest level of satisfaction and 6 the highest, most skills of recent social sciences graduates scored between 3 and 4, or less than 70%. Areas perceived to be strongest for graduate preparation included skills in administrative management, basic computing, and teamwork. Areas perceived to be weakest included English language ability, written communications, strategic planning and critical analysis. Most entities interviewed, in both public and private sectors, indicated they provided compensatory internal training for many of their employees and all indicated an urgent need for universities to incorporate more practical instruction in their curriculum. Interestingly, less than a quarter of those interviewed reported relying on external research products for decision-making, perhaps an indication of the low level of research orientation in the country overall. Starting salaries for 70% of recent social sciences graduates were at or below \$1,000 per month, only about 50% above minimum wage.

Recommendations based on the research results focused on the need for improved data and databases on 1) university professors and graduates along with their professional activity and 2) social science research conducted in the country. They also pointed to the need for improved university instruction in research methodologies and funding of social science research. Additionally, more and better platforms, mechanisms and opportunities for university-productive sector dialogue on professional capacities required were highlighted as critical to the development of national competitiveness. The potential for application of this capacity diagnostic research in Panamanian academia is considerable, for improved data collection and dissemination as well as for improved academic curricula tailored to productive sector needs. The potential for adaptation of this capacity diagnostic mixed methods design to other countries, sectors and markets is also considerable.

#### **IV. Potential Adaptations of the Methodology**

In today's knowledge economy, the assessment of higher education and research capacity as a means to developing strategies for productive long-term national development is crucial. Countries that fail to do this will be left behind and their university graduates will find themselves unemployed or under-employed and losing prime positions to those with superior education from elsewhere (World Bank 2000). The research methodology and design presented in this paper offer a relatively simple and customizable approach for embarking on this activity for almost any academic discipline in any country.

This type of investigation can be applied more specifically to uncover particular capacity gaps within individual academic disciplines or higher education institutes. It can also be used to delve deeper into levels of labor market satisfaction with distinct skill sets of

technical, analytical and interpersonal abilities. And it can be employed to better determine the types of research needed for different sectors and industries.

Limitations and obstacles to progressing with this type of research, as was found in the Panama case, include a general lack of university research teams. This is a major concern in many developing countries, where the traditional emphasis has been on teaching as opposed to research. Without more university professors with doctoral degrees, trained in sophisticated research methodologies, it is difficult to change this orientation and boost local quantitative research capacity. This type of academic context also minimizes the extent and reach of research culture, which in turn affects the allocation of funding for investigative efforts, the production of local universities and the utilization by the productive sector of whatever research is produced. These are important tendencies to propel toward change in developing countries if they are to become competitive in the global market—even with regard to provision for their national populations.

Not all academic research is expensive or methodologically complex. This case study and design illustrate how relatively simple secondary analysis and survey research can be employed economically to produce considerable information critical for advancing national production and capacity. This is vitally important for smaller countries in developing regions that may not have extensive human or financial resources available for high-cost, large-scale research. The hope with this project is that it can be used as a reference for bettering the higher education offer in Panama and also serve as an inspiration for similar research in other developing countries the world over.

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