Analysis of information in the academic management of the UNED, required in the self- assessment processes and the relation between research and design of the investigation

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Abstract

One of the institutional concerns of the Distance State University (UNED) to obtain appropriate information to sustain continuous improvements in the Diplomaed and Bachelor's degree and postgraduate program's to reach academic excellence. Consequently, one of the challenges faced by higher education, institutional policies and regulations is the consolidation and strengthening of the management of academic and other dependencies because of the culture of quality and excellence, and the ever-increasing demands of society. The Self-evaluation department of the Academic Quality Management Institute is responsible for contributing to compliance of these policies. Therefore, it proposes an information system, which should solve the needs that are not yet covered. Moreover, the information system should be accessed by academic dependencies, administrative clerks, university executives and by the IGESCA coworkers, in order to enhance evaluation, self-evaluation, certification, accreditation, re-accreditation processes of the University. The results of this investigation were achieved from the applied surveys and the interviews to the users, consisting with the information analysis. This paper specifies the importance and necessity for the information system, which will support the self-evaluation processes of the University. On the other hand describe the research design for this paper, in order to support academic management and decision making.

Keywords: Information System, University, Continuous Improvement, Academic Excellence, research design, research processes.

1. Introduction

The Distance State University (UNED) is a space for reflection and construction of knowledge and for that reason requires a commitment from the authorities in the continuous improvement of educational programs and services in order to obtain academic excellence.

This approach responds to various current and global trends such as the growth of the student population, the demand for business by professionals trained in different areas, for example, fields in which the University contributes day by day. Therefore the need for self-evaluation with a focus on continuous improvement and to the accreditation of careers becomes a daily constant to ensure quality in University education. With the support of the National System for the Accreditation of Higher Education (SINAES), the University has been able to accredit and self-evaluate 20 careers and continues on that same line.

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Consequently the focus efforts are into the management design and construction of information systems that facilitate and provide the information required for the mentioned processes of self-evaluation, accreditation, rendering of accounts and decision-making.

Furthermore, this paper describes the design used in the research and analysis of the data, required in the self-evaluation and accreditation processes of the UNED, as well as the need to have an alternative information system, which would provide the indicators necessary for the management of the self-evaluation, in order to improve and facilitate these processes.

2. General objectives

Analyze the data required in the self-assessment processes of the UNED, in order to obtain information from the University's information systems, and determine those that are not obtained by the same means.

Describe the research design carried out in the analysis of the data required in the self-assessment and accreditation processes of the UNED, in order to support academic management and decision-making and the need to have it.

3. Background

The careers or programs are analyzed with the purpose of self-evaluation in order to seek national or regional accreditation, or to continuous improvement, as an action in their commitment for academic excellence and quality culture.

The Academic Quality Management Institute (IGESCA) is part of the dependencies attached to the Academic Vice-rectory, committed to excellence in higher education.

Therefore it is contemplated in some objectives of the University to promote the culture of quality through research, dissemination and development of systems and indicators, techniques of instruments and methods or procedures.

The IGESCA is committed to seek quality in higher education, according to the SESIÓN 2502 University Council Agreement, article V subsection I b), will be assign the function of:

> "Contribute to the generation of a culture of academic quality management, through self-assessment processes in order to seek accreditation and academic evaluation for decision-making and monitoring of academic improvements resulting from these processes". (IGESCA Regulation, 2016, p.2, Article 2, paragraph b)".

Information systems are necessary to fulfill this objective and which provide the necessary inputs (data required) that support the management of IGESCA, in its constant search for academic excellence.

Moreover, with the information that is gathered, not only from the information systems, but also from surveys that are applied to students, professors, graduates, employers, among others, a Self-Assessment Report is elaborated regulated by the National Accreditation System Accreditation Manual of Higher Education

(SINAES) in Costa Rica or another regional accrediting agency of choice for the educational program.

Specifically, the Official Accreditation Model Degree Programs of the National System of Accreditation of Higher Education for Distance Modality (SINAES) has four dimensions, 19 components, 168 criteria, 378 evidences and 30 standards, which are obtained from the analysis of the information provided by automated systems and the dependencies of the University, together with the data collected from the applied surveys. (Official Degree Accreditation Model of the National System of Accreditation of Higher Education for Distance Modality, 2011, p. 28). The information systems of the University cover mostly the necessary answers of the report; however, some of them are not contemplated. For example, in terms of academic staff, the information of Human Resources Office indicates that the last degree obtained (diplomaed, bachelor's, master's degree or doctorate) and the report needs to be detailed "ALL" the degrees obtained.

Besides, it is for cases like the previous one, that each Career or Program is required to collect the data separately and sometimes manage it in a database (Excel or similar) in order to comply with the information required in the self-evaluation report and not provided by the University through existing computer systems.

In addition to describing the design used in the research conducted in this paper, is also intended to highlight the information indicators necessary for the management of academic quality at UNED.

4. Theoretical framework

In the development of this paper, the purpose of the research was to obtain the results required to implement an academic quality management system focused on providing the information required for the University's self-assessment and accreditation processes. Therefore, a work plan was designed to be followed, which is detailed in the following section on research methodology.

4.1. Research methodology

Because of detected deficiencies in the information that is collected in the management of the academic quality of the UNED, the approach of this paper is investigate and analyze what information or indicators are available in the existing information systems and which are those that are not available, in order to propose an information system that contemplates all of them.

The importance of this topic lies in the fact that academic management is used in the continuous improvement of careers, but also in order to accredit careers with the organizations that regulate these issues at national and regional level.

Therefore, the continuous improvement of careers also requires agile information systems, which need to provide the necessary information for continuous improvement and support for decision making.

Hence it also contemplates the explicit or implicit activities of the mental or non-mental design that were carried out in the development of this investigation to detail the relationship that exists between design and research. (Callaos and Callaos, 2008)

4.2. Research type

The type of research is mixed, because it intends to specify important characteristics of the phenomenon under study (descriptive research, Hernandez and Fernandez, page 103) and therefore is quantitative, because with the collection of data and statistical analysis, it is intended to learn the behavior and prove theories. In this case, the need for the information that is required in the management of academic quality in the UNED.

Based on Hernández and Fernández (2006), the research classified as non-experimental because no experiments are carried out, transectional because it collects data in a single moment (page 208), exploratory because it seeks to know a set of variables or situation (page 209), applied to new research problems and constitute the preamble of other designs.

Therefore, when exploring an event or situation, the vision of the problem of interest and the results are valid for the time and place where the study took place. (Page 210)

Moreover, the design is considered as indicated by Hernandez and Fernandez (page 158), "the plan or strategy conceived to obtain the information that is desired", in this case, the design of the research was conceived as a felt necessity on the self-evaluation and accreditation processes at the University.

Nevertheless, design can be according to Callaos and Callaos (2008), defined as many concepts, but relevant to this research like: a kind of representation, which starts as mental processes, with the intention of action, based on practical reasoning, in order to answer the questions Why (purpose, intention), What (goals) and How (specific design).

Why: the mental intention process arises due to a felt need, identified as lack of information that supports University management and decision making concerning academic quality and self-assessment and certification activities.

What: support the academic management of the UNED and decision-making, to cover that felt need. The need to integrate academic management processes into an institutional information system that includes links with other agencies (research, administration) that support the academic management of the UNED that facilitates planning and decision-making (with regulated, standardized processes and refined and updated databases), focused on continuous improvement that leads the Institution to meet quality criteria that lead to academic excellence.

How: various stages: identification of needs, collecting the required information, make a proposal to the University, seek funds or sponsor, implementing the proposal, validation and follow up to the University authorities in order to achieve the objectives.

Besides, it can be added for what: strengthening existing systems, creation of other ones that are required, updated and refined interrelated information, minimize duplication of information, access to data quickly and efficiently, issue reports with the necessary information and more.

Also, according to Callaos and Callaos (2008) the relationship among research, design, research design and design research can be represented in this paper, as follows:

When the investigation processes begin, a mental or non-mental process arises; which refers to the design of the investigation, in order to take actions that lead the

investigation to obtain concrete results. Consequently the concrete results are expected for the investigators in order to enhance the problem or objective being addressed.
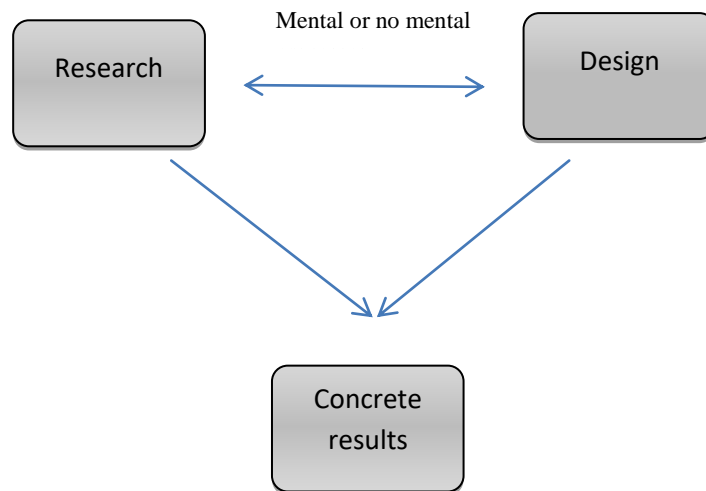
Figure 1. Concrete results of the investigation considering research and design

Furthermore, in the development of this research was used:

- The analysis of information requirements through forms designed with that objective.
- The interviews applied to users and University authorities.
- Analysis of the information collected.
- Compile of the indicators and requirement for the information system.
- The research Tools used: surveys, interviews, analysis of information, mental map, work plan, schedule.

For the purposes of this research, it is important to define the term: Information Technologies, which, according to Cohen and Asín, 2014 are: "... those technologies that allow and support the construction and operation of information systems". (P. 72).

Within the information technologies are the information systems that according to Cohen and Asín, 2014: "... is a set of elements that interact with each other, in order to support the activities of a company or business ..." (page 69).The information systems of a company, business or institution support daily transactions and the collection of information, which in turn becomes a key process in decision-making. Not the information itself, perhaps, but the indicators that results from the findings.

Information systems have databases that store the information that is collected. Sometimes the information is large volumes, which by themselves alone, they are only data; for example, a table of students, but if the same table has many records, it is necessary to analyze the information in order to obtain data as indicators, which serve to support the decision making and the academic management of the University

But before continuing, it must be defined, what is an indicator?

According to Laudon and Laudon et al. the indicators are: "... statistical information represented by means of relations, in which two or more variables intervene", and in turn, indicates that there are different types such as social, economic, health, among others. (Pages 148-149).

That is, these indicators facilitate decision making, by analyzing the information and reflecting a result that is usually a number or a percentage. For this reason, in order to obtain indicators, a decision-making system is also needed, that is, a first transactional system is the one that achieves the automation of operational processes within an organization (Laudon and Laudon, p.73), followed by the system that provides the information (indicators) that support decision-making and in this sense two are considered:

- The information system that provides an indicator and leaves decision-making to a person
- The Information System, which provides the indicator and in turn suggests which solution, should be taken.

But in addition to information systems, technological innovation is important in these processes, and according to Schilling (2008) "... it is often classified into different types ... which in turn require different types of knowledge ..." (p. 43).

This in turn reinforces the main idea of this article in relation to the need to obtain the required information from different sources, or where appropriate, information systems.

In the following section, the information requirements to support academic excellence in the University are detailed.

## 5. Information requirements for self-assessment procesess

The self-assessment in academic process, according to Acón and Trujillo (2012) is defined as: "the research process of various aspects of academic work, in order to promote its improvement".

The next step is the University accreditation. In Costa Rica is dictated by the National System of Accreditation of Higher Education (SINAES), and according to Acón and Trujillo (2012), is: "the act by which an accrediting entity grants and gives public faith, that the institution, program or career complies with the quality standards established in order to obtain the title of accredited career"

In that order of ideas, professional accreditation is different, since it is obtained by the person in their specialty field, and must comply with the requirements established by the different agencies or accrediting bodies.

Institutional accreditation is also relevant for universities, but it is not considered for this article, and it is defined by Cruz and Rama (2016) as: "it is what certifies that the institutions that have gone through this process offer quality programs".

Every career should desire specifically attributes of the graduates or particular programs, obtaining those shills during the course of the study of that career. For example, to the question of how satisfied are the graduates in the career of Diplomaed, and Bachelor degree of Preschool Education, the answer was:
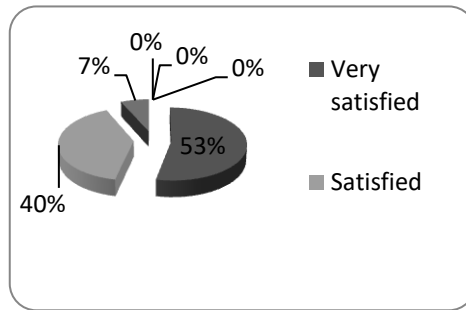
Figure 2. Degree of satisfaction with the professional actualization received in the Career.

Another example is the perception of the graduates related to the frequency that the career offers actualization activities.
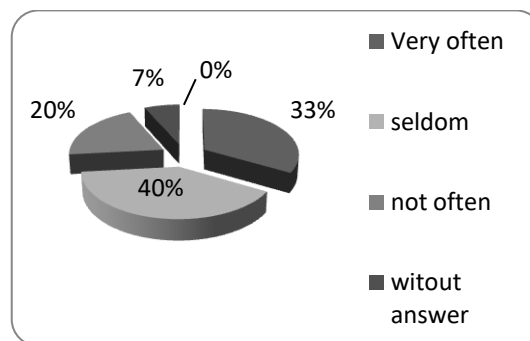
Figure 3. Frequency with which the Career offers professional actualization activities

The information collected and analyzed as the previous graphs, concerned to the abilities and professional actualization of the graduates are relevant topics used in the self-assessment and accreditation of careers.

The information required for the self-assessment, continuous improvement processes, academic excellence and accreditation, can be classified in two: the necessary information provided by the existing transactional systems and the one that is not obtained from them, therefore it is necessary to collect it.

That is, the existing transactional systems provide adequate information through queries to a database and also the one that is extracted from them using computer software called "APOYO" and presents it for the preparation of the reports.

The self-assessment report is also prepared with the information issued by the Center for Research and Institutional Evaluation (CIEI) responsible for statistics and official information of the UNED.

Following the same order of ideas, there is information available for the reports, such as the following examples:

- The number of students per career per year.
- The number of graduates per career per year.
- The student registration by career and per year.
- The assignment of academic staff times for academic staff.
- The report of students' notes by career, by subject, by year.

Likewise, other information has been detected that the information systems do not provide, which have been divided by areas: production of materials, curricular design, academic self-evaluation, accreditation, research, extension, internationalization, University centers, Academic Vice-rectory, information and resources bibliographic, continuing education: graduates, students' academic records, performance evaluation and others, for a better understanding and following are some examples:

Production of materials (audiovisual, multimedia, printed)
1. The number of Didactic Units that are elaborated.
2. The number of audiovisual productions.
3. The number of multimedia productions.
4. The number of books printed (physical and digital).

Curricular design and evaluation of learning
1. Percentage of changes in the subjects of the curricula, accumulated during the validity of this.
2. The number of curricular designs and redesigns of elaborated subjects.
3. List of subjects that need updating in each chair.
4. Traceability of the design or redesign of subjects or courses.

Self-evaluation and Accreditation
1. Indicators necessary for the process of self-evaluation and / or accreditation.
2. Follow-up to improvement plans.
3. The number of scholarships per career in the Directorate of Student Affairs (DAES).
4. Percentage degree of the academic staff.

Academic and administrative staff
1. The number of years of teaching experience.
2. The number of years of professional experience.
3. Categories in academic regime.
4. Training, improvement and updating.

Research and Extension
1. Research and extension projects.
2. The number of students participating in research and extension projects.
3. Systematic record of the investigations: their descriptors, finalization, and evaluation.
4. Time allocated to the academic staff who dedicate to projects of research and extension.

Internationalization
1. Internships by academic teachers.
2. Scholarships according to official, dependence place and type.
3. National and international congresses that are assigned and form of financing.
4. Careers that could be projected internationally.

University Centers
1. The number of graduates by University center and career.
2. Infrastructure and inventory of existing technology.
3. Support services provided
4. Students per center, per race

Information Center and Bibliographic Resources
1. List materials by information centers and bibliographic resources
2. List of services that provide
3. Statistics on the use of virtual libraries by School, by chair by program.
4. List of academic information networks, periodicals, virtual libraries, databases, electronic journal or others available in each area of knowledge

Therefore, for the indicators listed above as example from the total of 165, there is no institutional information system so far, that can provide them as is required for self-evaluation and accreditation reports of careers and programs of the University and / or to support decision-making and the rendering of accounts in an expeditious manner.

6. How to achieve those indicators?

The indicators quoted are so many, and sometimes it is difficult to collect them, therefore many times it is done manually, because the existing information systems of the University do not allow generating that information automatically.

6.1. Methodology

To achieve the aforementioned indicators, it is necessary from the transactional system to make modifications to the existing tables; make new ones, or even construct new databases, or similar. Hence this paper seeks to collect the needed requirements as a first step in to enhance the quality management at the University and also support and facilitate the decision-making.

6.2. What is required?

It requires the support of the authorities, the necessary budget and human resources that can focus on a specific information system, for self-evaluation and accreditation reports with a view to academic excellence.

To implement an information management system based on Information and Communication Technologies, which allows the demands of the academic units and other dependencies required for the processes of self-evaluation and continuous improvement to be handled quickly and efficiently.

To have support information for the indicators to be evaluated in the program self-evaluation process, updated by each of the sources.
An information system must be designed to meet the strategic objectives of the organization.

To process the information that enters the different academic units and other

dependencies of the University; which allow the analysis, storage and presentation; providing the different users with the necessary information facilitating the management.

To decrease the times of the processes, leaving more spaces for academic discussion and consultation.

To reuse information already created that minimizes the time required in the processing and presentation of data.

7. Benefits of that implementation

There are many benefits that would be provided by an Information System focused on self-evaluation and accreditation at UNED, with the information generated by the four schools of the University, such as that of tutors, recognition of subjects and others manually.
With the system functions would be automated, which in turn results in better use at all levels.

Below, some of the benefits perceived at this time are described.
- Saving time when the information is obtained
- Better use of human and technological resources.
- Avoid duplication of functions.
- Reliability of the required information.
- Streamlining of the self-evaluation processes and the analysis of results.
- Multiple benefits for the four schools.
- Support for decision-making and accountability of University authorities, at the medium and high level.
- Better control of information with a view to continuous improvement and service to the student.

8. Conclusions and recommendations

After analyzing the information requirements in the form of indicators for self-evaluation and accreditation management in the University, it is concluded that to develop a system, which contemplates queries from the Student Administration System (SAE) of the AS-400 and others, as Human Resources, to obtain the information of self-assessment and accreditation indicators in a fast and efficient way, it would bring many benefits to the dependencies involved in this processes.
This is also the beginning of future articles related to the implicit benefits of joining information systems and sharing databases, in order to support the management of academic quality and decision making.

This investigation is only the beginning of a new project by joining information system and sharing databases, as new ones as well, in order to achieve the objectives

9. Future lines

It is intended to continue with the research carried out, determining what are the technical and financial requirements needed in order to propose to the University authorities the replication of this system for all careers and programs that wish to incorporate continuous improvement, self-evaluation, accreditation, academic excellence and decision-making.

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