

Influence of information systems for measuring quality standards in higher education

Influencia de los sistemas de información para medición de estándares de calidad en educación superior

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Abstract

The evolution of the quality of higher education motivated the present research, whose objective was to determine the influence of computer systems for measuring quality standards, applying descriptive, qualitative-quantitative methodology and interviews with teachers, whose results showed limited communication of quality standards because there are no specialized databases for their maintenance, making decision-making difficult. In conclusion, organized databases should be incorporated to maintain permanent control of the evolution of quality standards for continuous improvement.

Keywords: Systems, Information, Standards, Quality, Education, Higher Education.

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Resumen

La evolución de la calidad educativa superior motivó la presente investigación, cuyo objetivo fue determinar la influencia de sistemas informáticos para medición de estándares de calidad, aplicando metodología descriptiva, cuali-cuantitativa y entrevista a docentes, cuyos resultados evidenciaron limitada comunicación de estándares de calidad porque no existen bases de datos especializadas para su mantenimiento, dificultando la toma de decisiones. En conclusión, deben incorporarse bases de datos organizadas para mantener control permanente de evolución de estándares de calidad, para la mejora continua.

Palabras clave: Sistemas, Información, Estándares, Calidad, Educación, Superior.

Introduction

Quality is a general term that is not only referred to education, but has implications in different areas, being currently considered as a scientific discipline, for example, (Lago de Vergara et al., 2014) conceive this branch of knowledge as "the satisfaction of the standards stipulated for resources, processes, based on the comparison of the results obtained", in the same way, (Lago de Vergara et al., 2014, p. 34) established that "quality results from the comparison between expectations and perception, whose measure is satisfaction".

From this point of view, Inquilla et al., (2017), Barros-Bastidas & Gebera, (2020) conceive the quality of higher education as the meeting of the requirements of comprehensiveness, coherence and effectiveness that should lead to the solution of society's problems and the satisfaction of citizens' demands

One of the most relevant points of quality assessment is associated with the agreements that emanated from the Bologna Treaty, whose declaration was signed by some European countries and had an impact not only in Europe, but also in Latin America, because it proposed the measurement of the quality of higher education as part of the self-assessment and accreditation of academic units. (Félix & Briones, 2018, p. 32).

In this regard, this treaty signed in Bologna, Italy, at the end of the twentieth century, established an analogical method that promoted the comparison of the quality assurance system with the standards required in relation to human talent, resources, learning and institutional management, and also took into account the perception

of student satisfaction with the service received. Scharager & Aravena, (2010).

The information systems, consisting of hardware and software, contribute to maintaining the standards that demonstrate the quality of higher education and constitute a solid basis for decision making, because they objectively reflect the evolution of universities through statistical figures that reflect the movement of evaluation indicators, which in turn facilitate quality assurance, stakeholder satisfaction and accreditation of university academic units. Guadalupe, (2013).

Information systems are described as "the set of organized data that facilitate the processing and management of information, which contribute to form a baseline for the evaluation of objectives and for managerial decision-making". Indeed, UNESCO in the foreword of its planning guide states that the new challenge of education systems is precisely the incorporation of information and communication technologies (ICT) in all managerial, administrative and operational activities arising from the service offered by educational institutions at all levels and not only for the benefit of the teaching-learning process. (UNESCO-IEU, 2010).

Based on these criteria, the theoretical importance of information systems for the maintenance of organized and coordinated databases of higher education quality standards in each institution is established, in order to maintain a line of action that contributes to sound decision making, which promotes continuous improvement of stakeholder satisfaction.

For this reason, the objective was to determine the influence of information systems for measuring quality standards in higher education, based on a mixed qualitative and quantitative study, which used information from secondary sources inherent to quality standards and expert criteria on how information systems affect the maintenance of the databases of the standards for the accreditation of university academic units.

Materials and methods

The present research used a mixed approach, because: qualitative research was applied by interviewing three professors who are pursuing doctoral or PHD training outside the country, to know their criteria about the incidence of information systems in the measurement of quality standards in higher education; but the quantitative method was also used through the graphic illustration of the indicators of the database of the standards in question,

information that was provided by the Faculty of Jurisprudence, Social and Political Sciences of the University of Guayaquil.

Descriptive research was applied because the data of the academic unit mentioned in the previous paragraph were approached, without the need for deliberate manipulation of the variables or of the information collected on the standards of quality in higher education.

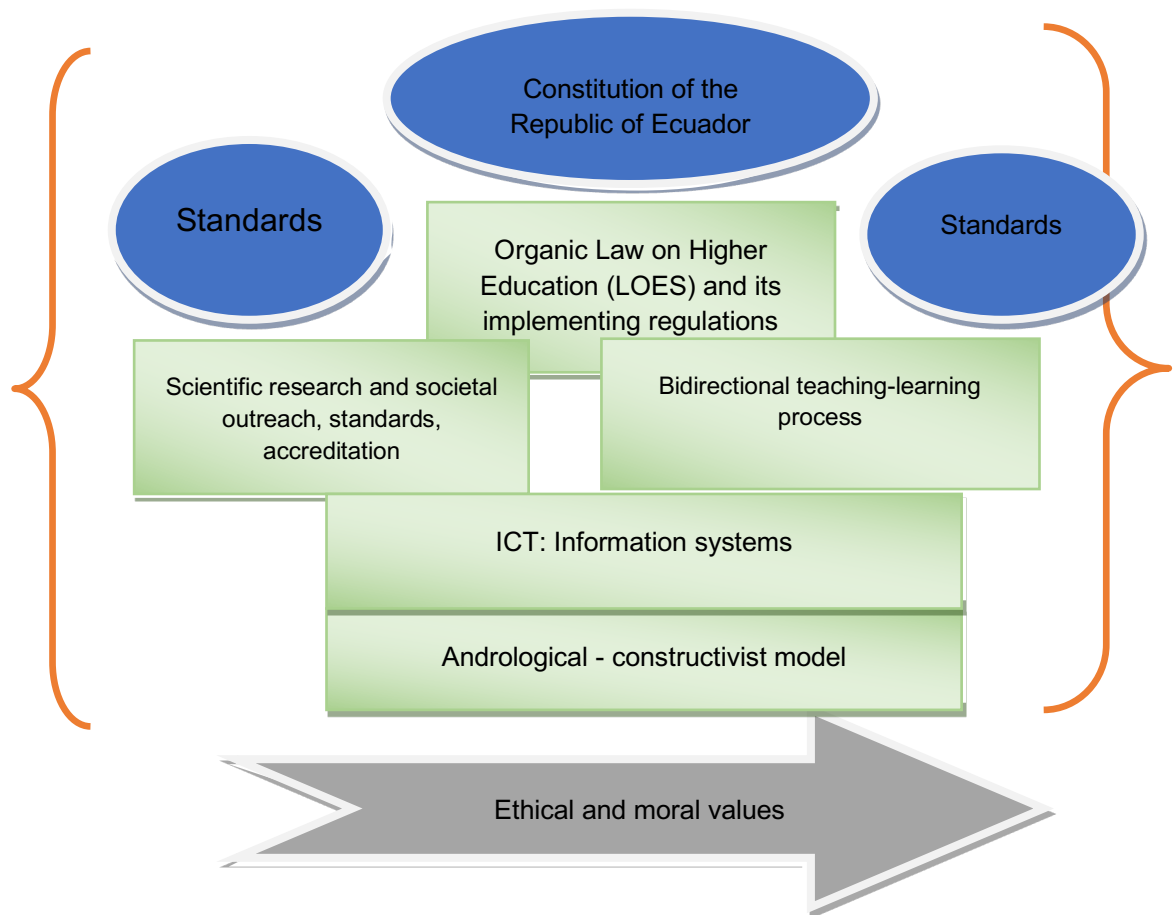
Documentary research was used because information was collected about the main standards of quality in higher education in the academic unit where this article was delimited, but field study was also used to apply the interview to three professors who are pursuing doctoral or PHD training outside the country, in order to deepen their knowledge about the problem under analysis. The qualitative technique of the interview was applied by means of the structured guide to three professors, with the purpose of knowing in greater depth the impact that information systems have on the maintenance and evaluation of the quality standards of higher education, to which were added the statistical graphs of some of these standards of the academic unit where the study was delimited.

Prior to the application of the research techniques detailed in the previous paragraphs inherent to the methodology, the model of the quality of higher education today was discussed, which according to the (CEAACES, 2017), is based on a systemic and generic approach based on standards that facilitate the evaluation of academic units and contribute to the accreditation of university academic units.

The model for evaluating the quality of higher education is based on the pillars of relevance established in Article 107 of the Organic Law of Higher Education, in the curriculum, the academy, the institutional environment and the students, the latter being the fundamental mission of the work carried out by universities at the national level and having a direct association with society in general, since all elements of the community are immersed among the stakeholders.

In the author's opinion, higher education is based on the axiological axis of ethical and moral values, which support the constructivist andragogic model of the teaching-learning process and which are adequately complemented by ICT (hardware and information systems) that contribute emphatically to teaching and student activities, among which are scientific research, business internships, links with society, bidirectional learning and evaluation of professionals, graduates and apprentices, as established by the principle of belonging in Art. 107 of the LOES and Art. 350 of the Constitution of the Republic.

Figure 1. Model of quality evaluation of higher education under standards supported by information systems.



Results

The first step was to interview three professors who are pursuing doctoral or PHD training outside the country, for which authorization was requested from the respective academic unit of the University of Guayaquil to begin the research process, the results obtained during the field research are presented below.

Table 1. *Teacher interviews.*

Questions	Diana Espinosa Mgs.	Carmen Rugel Mgs.	Rita Solórzano Soto, Esq.
Have the quality standards been adequately disseminated in the academic units of the University of Guayaquil?	I know some quality standards because I work in the systems area of this academic unit, but that does not mean that they are widespread because the degree of communication of these standards is low and therefore, their lack of knowledge must be high in the community of teachers and students.	I am not aware of all the quality standards in this academic unit, I only know some of them because I needed this information on some occasions and I had to get it from the Systems area, but it was not complete.	Quality standards are not widespread in this academic unit, although I was able to get some standards because I needed them when I started as Student Welfare Manager, but they are too few for what I believe should exist in a well-coordinated database.
Is there a database for periodic verification of quality standards in this academic unit?	There is no database for the periodic verification of quality standards in this academic unit, but there are indicators in an Excel register.	There is no database specialized in quality standards information in this academic unit.	Of course it doesn't exist, because if it did, it would have been provided to me as part of my order when I started as a Student Welfare Manager.
How do information systems contribute to the evaluation of the quality of higher education?	Information systems make it possible to maintain a reliable and well-organized data base, which is very useful for decision making.	Information systems maintain organized data, which serve to demonstrate the trend toward or away from optimal quality.	Through information systems, it is possible to demonstrate the quality trend of higher education in each academic unit, which contributes to accreditation and quality assurance.
Questions	Diana Espinosa Mgs.	Carmen Rugel Mgs.	Rita Solórzano Soto, Esq.

What is the influence of information systems on the measurement of quality standards in higher education?	The maintenance of accurate databases on the quality standards of higher education, through information systems, influences decision making for its continuous improvement.	The influence of information systems is that it accurately demonstrates how quality standards evolved over time and whether objectives were met.	Undoubtedly, information systems facilitate the precise knowledge of the evolution of quality in academic units, in order to promote corrective and preventive actions that have a positive impact on continuous improvement.
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What is the feasibility of implementing a specialized information system for measuring quality standards?	Currently, universities have sufficient budget allocations to implement an information system or specialized database for the measurement of quality standards, which would be very useful for continuous improvement.	He considered that it is feasible to maintain an adequate information system, not only for the measurement of quality standards in higher education, but also for its archiving, because it is very important to have these standards in order to achieve accreditation and to show the increase in satisfaction of the educational community and stakeholders.	Feasibility exists for the implementation of a specialized information system for the measurement of quality standards in this academic unit, since the attainment of accreditation depends on quality assurance and standards have this effect, therefore it should be considered as a proposal to be applied and approved by the respective authorities.
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Based on the information provided by the teachers interviewed, who were satisfied with the implementation of an information system for the measurement and maintenance of quality standards in higher education in the Faculty of Jurisprudence, Social and Political Sciences of the University of Guayaquil, some indicators of great relevance and impact on the quality system of the academic unit in question were collected.

The Faculty of Jurisprudence, Social and Political Sciences of the University of Guayaquil, maintains equity in the classification of teachers hired with appointment (tenure) or those who eventually work under an employment contract, generally for six-month or annual periods, in some cases, with renewal for two years, a finding that without being negative can promote decision-making by the university authorities, to request the corresponding budget allocations that allow them to maintain a greater number of tenured professors.

Due to the efforts of the authorities of the Faculty of Jurisprudence, Social and Political Sciences of the University of Guayaquil, at present, four-fifths of the professors work full time, while only one-fifth work part time, representing a good symptom as stipulated in Art. 12 of the Regulations of the Career and Rank of the Professor and Researcher of the Higher Education System, which refers to this specific case of the working time of university professors.

Currently, almost all the professors of the Faculty of Jurisprudence, Social and Political Sciences of the University of Guayaquil have a Master's degree, a positive evolution compared to the statistics of 2013, when only a third of the university faculty held a postgraduate degree, including some who only had diplomas and specialties, which has been the result of the demand of government authorities to promote the strengthening of the quality of the higher education system.

More than five-sixths of the teaching staff of the Faculty of Jurisprudence, Social and Political Sciences of the University of Guayaquil have a Master's degree in their specialty, only one-sixth have general Master's degrees without a focus on the specialized area of teaching, in compliance with Articles 19 and 20 of the Regulations for the Career and Rank of Professors and Researchers of the Higher Education System, which establish the requirements for academic staff of university establishments.

While teachers with doctoral degrees only reach 9% to date in the Faculty of Jurisprudence, Social and Political Sciences of the University of Guayaquil, however, due to the fact that 14% of university professors are pursuing a PHD, it is estimated that before 2020, a quarter of the teaching population of the academic unit in question will hold a doctoral degree, despite this, three quarters of teachers will not hold doctoral degrees until 2020, in violation of Art. 150 literal a) of the Organic Law of Higher Education (LOES). (National Assembly, 2010).

It is necessary to highlight the current student/teacher ratio at the Faculty of Jurisprudence, Social and Political Sciences of the University of Guayaquil.

Table 2. *Indicator of students per teacher.*

Description	Jurisprudence	Sociology	Total
Students	4.100	800	4.900
Teachers			
Students per teacher indicator			

In the Faculty of Jurisprudence, Social and Political Sciences of the University of Guayaquil, each teacher attends an average of 30 students, in the Faculty of Jurisprudence there are 29 students per teacher and in Sociology an average of 38 students per teacher, although the first academic unit has more students, however, there is a more adequate ratio of students per teacher.

Discussion

The most relevant findings determined in the present research indicated, in the first place, the limited communication and dissemination of the quality standards of higher education by the academic unit where the study was carried out, due to the lack of a specialized database for their maintenance, which hinders decision making for continuous improvement.

The academic staff of the academic unit under study agreed with UNESCO's manifestoes, which in the foreword to its planning guide, referred to the incorporation of information systems as one of the mainstays for achieving and maintaining accreditation, as well as for permanently increasing the degree of satisfaction of the interested parties. This means that the teaching staff of the academic unit under study, agreed with the manifestos of UNESCO, which in the prologue of its planning guide, referred to the incorporation of information systems as one of the appropriate strategies to meet the challenge arising from the new paradigm in which the quality of higher education is based.

By making a brief example of the database, whose implementation was proposed to the academic unit under analysis, it was possible to establish according to actual data collected at the present time, that

although it is true that teachers meet the requirements of the postgraduate degree of Master specialized in the teaching area and full-time work, however, they fail to comply with the requirement of holding a doctoral degree, opposing Art. 150 literal a) of the Organic Law of Higher Education (LOES), which may be associated to the fact that almost half of the faculty does not have an appointment and therefore cannot receive the scholarship to study a PHD abroad.

As can be seen, the analysis of the quality standards of higher education based on the example database allows the authorities of the corresponding academic unit to make decisions regarding the request for allocations to increase the number of teachers with appointments, so that in turn a greater number of teachers can receive scholarships for doctoral studies, so that this has an impact on their academic degree and can meet the requirements of Art. 150 of the LOES and the regulations of the Regulations of the Career and Rank of the Professor and Researcher of the Higher Education System.

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