

Original article

**Research and research culture. Their relationship in the 21st century
university**

Investigación y cultura investigativa. Su relación en la universidad del siglo XXI

Pesquisa e cultura de pesquisa: seu relacionamento na universidade do século 21

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Abstract

Higher Education Institutions contribute to solving social problems through the generation and dissemination of knowledge. This study aims to reflect on the dialectical relationship between research and research culture in the 21st Century university, based on its current state at the University of El Salvador. For this purpose, qualitative research was conducted from the interpretative paradigm. The theoretical methods employed were historical-logical, analytical-synthetic, and inductive-deductive. Empirically, a documentary analysis was carried out to collect

information, followed by a triangulation of sources and documents to compare the results, identify common elements, reflect, and analyze based on the inferences made. The findings revealed that the research culture of the university is consolidated through the scientific activity it is capable of promoting to fulfill the social mission of universities. Therefore, to the extent that there are incentives outlined in university regulations to encourage research and their compliance is monitored among faculty and students, the research culture can be strengthened, and the scientific output of higher education institutions can increase.

Keywords: science and innovation, higher education institutions, cultural promotion, scientific production, university community.

Resumen

Las instituciones de educación superior contribuyen a la solución de los problemas sociales mediante la generación y socialización del conocimiento. El presente estudio tuvo por fin reflexionar acerca de la relación dialéctica entre la investigación y la cultura investigativa en la universidad del siglo XXI, a partir de su estado actual en la Universidad de El Salvador. Para ello, se desarrolló una investigación cualitativa desde el paradigma interpretativo. Los métodos teóricos empleados fueron el histórico-lógico, el analítico-sintético y el inductivo-deductivo. Desde el punto de vista empírico, se realizó un análisis documental para la recolección de la información y, posteriormente, se hizo una triangulación de fuentes y documentos para contrastar los resultados, identificar los elementos coincidentes, reflexionar y analizar desde las inferencias realizadas. Los resultados evidenciaron que, la cultura investigativa de la universidad se consolida en la propia actividad científica que esta sea capaz de impulsar para cumplir con el encargo social de las universidades. Por lo tanto, en la medida que existan incentivos plasmados en las normativas universitarias para incentivar la investigación, y se controle su cumplimiento en los docentes y estudiantes, se podrá consolidar la cultura investigativa e incrementar la producción científica de las instituciones de educación superior.

Palabras clave: ciencia e innovación, instituciones de educación superior, promoción cultural, producción científica, comunidad universitaria.

Resumo

Instituições de ensino superior contribuem para a solução de problemas sociais por meio da geração e socialização do conhecimento. O presente estudo teve como objetivo refletir sobre a relação dialética entre pesquisa e cultura de pesquisa na universidade do século 21, partindo de seu estado atual na Universidade de El Salvador. Para isso, desenvolveu-se uma investigação qualitativa a partir do paradigma interpretativo. Os métodos teóricos utilizados foram o histórico-lógico, o analítico-sintético e o indutivo-dedutivo. Do ponto de vista empírico, foi feita uma análise documental para a coleta de informações e, posteriormente, um triangulação de fontes e documentos para comparar os resultados, identificar os elementos coincidentes, refletir e analisar a partir das inferências feitas. Os resultados mostraram que a cultura investigativa da universidade está consolidada na própria atividade científica que é capaz de promover para cumprir a missão da sociedade universitária. Portanto, na medida em que houver incentivos incorporados em regulamentos universitários para incentivar a pesquisa, e seu cumprimento for controlado em professores e alunos, será possível consolidar a cultura investigativa e aumentar a produção científica de instituições de ensino superior.

Palavras-chave: ciência e inovação, instituições de ensino superior, promoção cultural, produção científica, comunidade universitária.

Introduction

Higher Education Institutions contribute to solving social, economic, environmental, health, educational, and other social problems through the creation and dissemination of knowledge. To meet societal demands, both public and private higher education institutions must engage with a sense of social responsibility, especially those with a public character.

In this regard, the United Nations Educational, Scientific and Cultural Organization (UNESCO) states in the *World Declaration on Higher Education for the 21st Century* that the mission of higher education institutions is to:

promote, produce and disseminate knowledge through research and, as part of the services they provide to the community, to offer the appropriate professional competencies to contribute to the cultural, social, and economic development of societies by promoting and developing scientific and technological research and research in the social sciences, humanities, and creative arts. (UNESCO, 2019, p. 10)

This shows how the institution conceives research as a process that promotes social and cultural development. These criteria are also endorsed by the Organization of Ibero-American States for Education, Science, and Culture, as it seeks to integrate higher education and research in Ibero-America to fulfill the 2030 Agenda.

Central American universities have made this commitment with seriousness and responsibility. In this scenario, the research culture and its relationship with the social mission of universities are crucial and serve as indicators that illustrate institutional results in this endeavor. In practice, it has been shown that without a research culture, the scientific output of any Higher Education Institution is low.

According to Alarcón (2021), the scientific production of both public and private universities in Central America, based on contributions published in Scopus, is as follows: 4739 in Costa Rica, 759 in Guatemala, 682 in Panama, 526 in Honduras, 495 in the Dominican Republic, 288 in Nicaragua, 256 in El Salvador, and 60 in Belize. These data reflect that scientific production is minimal in the region and, consequently, it impacts the perception of the research culture within the region.

According to the 2020 report from the National Council of Science and Technology of El Salvador, data regarding scientific activity was received from 11 specialized institutes (5 public and 6 private), 6 technological institutes (3 public and 3 private), and 24 universities (23 private and one public). The universities that reported the highest number of research activities were Universidad José Simeón Cañas with 148 researchers, Universidad de El Salvador (UES) with 116 researchers, and Universidad Católica de El Salvador with 55 researchers (Aguilar & García, 2022). As evident,

the country is not complying with Article 2 of the *Higher Education Act* (Decree No. 522, 1995), which aims to promote all forms of scientific research.

This study's goal was to consider the dialectical relationship between research and research culture at universities in the 21st Century, with a particular focus on the situation at UES. An interpretive research paradigm-based qualitative research methodology was used to achieve this. Historical-logical, analytical-synthetic, and inductive-deductive theoretical methods were all used. A document analysis was done to compile pertinent data from an empirical perspective. Following that, a triangulation of sources and documents was done to compare the findings, find commonalities, and analyze the findings in light of the inferences made.

Development

Research, Research Culture, and University

To generate and transmit their own knowledge, in line with the contexts of their location, universities need to embrace their own *research culture*, which encompasses the organizations, attitudes, values, objects, methods, ethical codes, and national and international policies that govern research (Mezquita & García, 2022). As Reyes and Moros (2018) point out, it is also related to organizational culture, encompassing leadership and communication skills that are part of the daily practice within the institution.

On the other hand, Tamayo and Restrepo (2011) state that the *research attitude* is cultivated through practical experience, seeking solutions to specific facts or problems through the application of the scientific method, which enables them to predict or explain events (p. 22).

Within the university context, the above facilitates professors and students to establish an interaction, leading to metacognition and the development of values that predispose them towards research. Research, in this context, is understood as "a systematic process of collecting and logically analyzing information (data) for a specific purpose" (McMillan & Schumacher, 2005, p.11). In this regard, Hernández and Mendoza (2018) define research as "a set of systematic,

critical, and empirical processes applied to the study of a phenomenon or problem with the result (or objective) of expanding knowledge" (p. 4).

Considering that research is an organized and systematic process with its own implementation method, it can be said that universities should provide training to their staff in different research modalities (quantitative, qualitative, or mixed) and teach it to their students through modeling and conducting research projects both within and outside their academic environments.

The culture surrounding research requires a training process starting from childhood when research skills, attitudes, habits, values, and investigative competencies begin to develop gradually and according to the academic level. By the time students reach higher education, the necessary research competencies will already be developed, and they will focus on acquiring the specific skills needed for knowledge creation and transformation to carry out research: knowing (knowledge), knowing how to do (skills), knowing how to be (values, attitudes, affections) and knowing how to live together (European Commission, 2014).

In this regard, according to García *et al.* (2013), *competencies* are:

The integration of an individual's level of preparation, training, and development resulting from their learning, based on the formation of basic principles, knowing, knowing how to do, knowing how to be, knowing how to share, and the ability to share or live within an academic, work, and social collective environment. Competencies involve applying knowledge, skills, values, attitudes, abilities, and experiences in different and changing socio-occupational contexts. (p. 7)

Indeed, in higher education, *research competencies* are strengthened and gain greater importance. According to Mezquita and García (2022), these competencies represent an organizational alternative where the values, attitudes, and knowledge of academic staff regarding research come together to address internal and external social issues within universities. However, for students to acquire these competencies through meaningful learning, it is necessary for professors to model them in various research exercises, both within the classroom and beyond.

As recognized by Morales *et al.* (2005), the goal is to teach students to conduct purposeful research in real contexts to contribute to social development. Achieving this requires that professors possess knowledge of how to conduct research, which is gained through conducting research in suitable contexts aligned with the research objectives.

The research culture of the university is strengthened through the scientific activity it is capable of promoting. To achieve this reciprocity, universities need to encourage the execution of educational programs, projects, academic exchanges, and other initiatives where researchers can apply their research skills and establish links between the social and exact sciences, fostering interdisciplinary nature of both.

Therefore, university management, should seek and apply innovative and creative alternatives in order to encourage interest and motivation towards research, all with the aim of nurturing a research culture within the institution.

Some of these incentives could include the possibility of earning credits to progress in the career ladder, achieving the position of research-oriented faculty, facilitating academic qualifications abroad, granting sabbatical leave for research purposes, or leading innovation initiatives, among others. These incentives represent a transformation of traditional thinking in the way problems are perceived and understood, shifting towards a more comprehensive and less rigid vision that allows for addressing economic difficulties associated with research or the lack of funding, resources, materials, and time (Tamayo & Restrepo, 2011).

Universities also need to conduct continuous assessments to evaluate their progress and setbacks, aiming to make changes based on identified limitations, strengthen successes, and take advantage of existing opportunities. This involves promoting the creation of new knowledge and discarding the prevalence of mere repetition, all of which challenges their growth.

Scientific production and research culture at the University of El Salvador

The *Organic Law of the University of El Salvador* (1999) states in its article 3, literal c, that the university has the mission to "train professionals who are morally and intellectually capable of

fulfilling their role in society, integrating the teaching, research, and social projection roles" (p. 59). This commitment is reaffirmed in its *Strategic Plan 2019-2023*, where these three fundamental functions are retaken as essential for a quality higher education, and the Academic Vice Rector's Office is assigned the management of the research process.

With this purpose, Secretariat for Scientific Research was created in 2014 as a coordinating and supervisory body for research activities, operating under specific policies aimed at modernizing the university systems involved in this endeavor. Additionally, it is responsible for fostering a research culture and strengthening scientific dissemination at the University of El Salvador through the organization of conferences, research projects, faculty training courses, and exchanges with other universities.

In particular, the Office of Innovation and Technology Transfer was founded in 2019 with the purpose of promoting the development of scientific and technological innovation at UES, the development of scientific and technological innovation at the UES, leveraging its academic and research units. It is responsible for encouraging entrepreneurship based on the outcomes of this process and favoring the creation of companies that generate a market for its introduction; mainly in the area of innovation and technological surveillance, legal and financial advice, among others. However, efforts to sustain a research culture at the UES date back to its creation in 1841, when the research thesis was established as a graduation requirement for undergraduate and graduate degrees. Different laboratory spaces and equipment were also conceptualized and set up, particularly in the exact and health sciences, to facilitate research activities.

However, despite having a legal and operational framework in place to fulfill this mission, the involvement of faculty, students, authorities, and administrative staff in this area remains insufficient. At the university level, the percentage of those engaged in research is minimal, often under the excuse of the time absorbed by teaching and the limited individual and collective research culture. Regardless of the conditions, the low research participation at the individual and collective level persists.

Therefore, one of the internal challenges for the UES is to promote a research culture within its community, as it enables the expansion of fields of inquiry and analysis and fosters a critical and transformative awareness of society (Tamayo & Restrepo, 2011, p. 22) to generate new knowledge. This involves maintaining academic excellence, utilizing the knowledge generated, enhancing research competencies, producing innovative technology and offering it to businesses, motivating faculty and students to conduct research and publish based on defined policies, and promoting scientific exchanges with other national and international universities.

Furthermore, it is essential for the university community to be actively involved in the management of the university's core processes, supporting and fostering research activities, and feeling committed to the institution's mission. Without such involvement, little to nothing can be achieved in practice to consolidate the research culture and scientific production at UES.

Conclusions

The research culture and research itself are the responsibility of universities, but they cannot fulfill this purpose without the contribution of the university community in strengthening the dialectical relationship among them. The consolidation of a research culture and the increase in scientific production at UES can be achieved by implementing incentives outlined in university regulations to encourage research and by monitoring their compliance among faculty and students.

While not all academics can dedicate themselves 100% to research, each faculty member should engage in research activities within and outside their teaching responsibilities and publish their findings. This will contribute to their personal acknowledgment and the institutional positioning of the university in national and international rankings.

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Authors' contributions



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Conflict of interest

The authors declare that they have no conflict of interest.

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