

## **El reto de las universidades públicas de México para incorporar una educación pertinente acorde con la sustentabilidad**

***The challenge for public universities in Mexico to incorporate a relevant education consistent with sustainability***

***O desafio para as universidades públicas mexicanas de incorporar uma educação relevante e de acordo com a sustentabilidade***

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### **Resumen**

El objetivo del presente trabajo de corte documental fue brindar una discusión teórica en torno a conceptos relacionados con el término *sustentabilidad* (es decir, desarrollo sostenible, educación ambiental, formación ambiental, ecopedagogía, biopedagogía y educación para el desarrollo sostenible) con el fin de detectar coincidencias y desacuerdos que sirvan de apoyo para gestores y tomadores de decisión de las políticas universitarias en el momento de incorporar dichos vocablos en el currículo de las instituciones de educación superior. Luego de presentar esa discusión teórica se puede concluir que las universidades públicas del país, como organizaciones complejas, tienen el reto de comprender e implementar los principios de la sustentabilidad dentro del currículo universitario como parte de su compromiso con la Agenda 2030 y los objetivos para el desarrollo sustentable. Asimismo, se debe tomar en cuenta que la estructuración actual que caracteriza a las universidades públicas del país — basada en la departamentalización del conocimiento— favorece a la fragmentación de la ciencia, realidad cuestionada por la EDS, la cual invita a la reconciliación de las distintas

disciplinas para contribuir al diseño y desarrollo de nuevos modelos teórico-metodológicos que permitan dar respuestas a los desafíos que enfrenta el desarrollo sostenible.

**Palabras clave:** desarrollo sostenible, educación ambiental, gestión educativa, interdisciplina, universidad.

### **Abstract**

The objective of this documentary work was to provide a theoretical discussion around concepts related to the term sustainability (that is, sustainable development, environmental education, environmental training, ecopedagogy, biopedagogy, and education for sustainable development) to detect coincidences and disagreements that serve as support for managers and decision-makers of university policies at the time of incorporating these words into the curriculum of higher education institutions. After presenting this theoretical discussion, it can be concluded that the country's public universities, as complex organizations, have the challenge of understanding and implementing the principles of sustainability within the university curriculum as part of their commitment to the 2030 Agenda and the objectives for it. sustainable development. Likewise, it must be taken into account that the current structuring that characterizes the country's public universities -based on the departmentalization of knowledge- favors the fragmentation of science, a reality questioned by ESD, which invites the reconciliation of the different disciplines to contribute to the design and development of new theoretical-methodological models that allow giving answers to the challenges faced by sustainable development.

**Keywords:** sustainable development, environmental education, educational management, interdisciplinary, university.

### **Resumo**

O objetivo deste trabalho documental foi fornecer uma discussão teórica em torno de conceitos relacionados ao termo sustentabilidade (ou seja, desenvolvimento sustentável, educação ambiental, formação ambiental, ecopedagogia, biopedagogia e educação para o desenvolvimento sustentável) a fim de detectar coincidências e divergências. que sirvam de suporte aos gestores e tomadores de decisão das políticas universitárias na hora de incorporar essas palavras ao currículo das instituições de ensino superior. Luego de presentar esa discusión teórica se puede concluir que las universidades públicas del país, como

organizaciones complejas, tienen el reto de comprender e implementar los principios de la sustentabilidad dentro del currículo universitario como parte de su compromiso con la Agenda 2030 y los objetivos para el desarrollo sustentável. Da mesma forma, deve-se levar em conta que a atual estruturação que caracteriza as universidades públicas do país - baseada na departamentalização do conhecimento - favorece a fragmentação da ciência, realidade questionada pela EDS, que convida à conciliação das diferentes disciplinas a contribuir para a concepção e desenvolvimento de novos modelos teórico-metodológicos que permitam dar respostas aos desafios do desenvolvimento sustentável.

**Palavras-chave:** desenvolvimento sustentável, educação ambiental, gestão educacional, interdisciplina, universidade.

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## Introduction

Future professionals of any discipline must have training consistent with the approach to education for sustainable development, an essential aspect to train technically qualified citizens to contribute to solving problems related to sustainability. The task, however, has not been easy due, in many cases, to the conservative structural organization of the universities (Bravo, 2012) at the time of fluidly undertaking a curricular change (González and Garza, 2013), which has It has been proposed using various expressions, such as education for sustainable development (Arbutnott, 2009), environmental education (González and Arias, 2015), ecopedagogy (Antunes and Gadotti, 2006) and biopedagogy (Pabón, Vargas, Rincón and Garzón, 2005).

These concepts guide the environmental and study plans of the different areas of knowledge from the approach of an integral formation of the student body, as indicated in article 3 of the Constitution of Mexico. However, how to put them into practice can present difficulties for teachers due to the multiple meanings that underlie them.

For this reason, the objective of this work is to provide a theoretical discussion around concepts related to the term sustainability (that is, sustainable development, environmental education, environmental training, eco-pedagogy, biopedagogy and education for sustainable development) in order to detect coincidences and disagreements that serve as support for managers and decision-makers of university policies at the time of incorporating these words into the curriculum of higher education institutions. For this, a bibliographic review has been carried out, of which the most outstanding reflections are offered below.

## Sustainable development

The origin of the term sustainable development finds its roots in the framework of the world commission established in 1987, where the concerns of governments were exposed to find new conceptions about the environment and its degradation as a consequence of a development model that exerts pressure on the biosphere and increases social inequalities. For this, the proposed proposal focused on promoting a change which they defined as lasting development.<sup>1</sup>, a concept that groups two closely related terms: environment and development.

Now, according to the Bruntland Report (Curiel, Peniche, Reyes, Alvarado and Hernández, 2005; Lescano, Vegas, Collazos, Valdez and Belaúnde, 2008), sustainable development is made up of the social, economic and environmental dimensions, the which are not only interrelated, but none can be above the others. Through this alternative development model, it is possible to improve people's quality of life, reduce inequalities and the deterioration of the biophysical environment, and contribute to the economic development of countries. According to the Educational Technology Research Institute [Inite] (2004), sustainable development is "one that guarantees the needs of the present without compromising the possibilities of future generations to satisfy their own needs" (p. 168).

Gutiérrez and González (2010), however, point out that this concept is holistic and articulates at least five dimensions: social, economic, environmental, political and cultural, a vision that arose from the need to promote a world development model compatible with environmental conservation. and social equity.

According to Ramírez, Sánchez and García (2004), the different approaches to this concept oscillate between two extreme ideas: on the one hand, thinking that the infinite use of natural resources is possible; on the other, those who consider that sustainable development corresponds to the protection and conservation of natural resources, hence they conclude that "it is a diffuse concept, difficult to delimit and absolute definition" (p. 59).

In the same way, there is a coincidence with what is referred to by Benayas, Alba and Sánchez (2002), who believe that with the emergence of the concept of sustainable development, the objective that maintained the focus of environmental education (EE), conceived as the medium, was abandoned. of rapprochement of people with nature and its

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<sup>11</sup> Consideramos que de esta manera surge el término *sostenible* que actualmente tiene vigencia en algunos contextos regionales.

conservation. These authors affirm that EE is a mechanism that allows to promote the change towards sustainable development models.

Even so, Aceves-Ávila (2013) also points out that there is no consensus on this term and that only what was stated in the Brundtland Report has been accepted, an argument supported by Bermejo (2014). For their part, Gutiérrez and González (2010) agree that this term is a holistic conceptual proposal with difficulties in how to operate it.

In sum, the discussion that is maintained around the concept of sustainable development focuses mainly on the term development (development), a term that connotes two extreme views: one that criticizes the use of natural resources for considering them infinite (sustainable development) and that that focuses on its rational and durable use (sustainable development).

### **The effect of the regional context on the conceptualization of the term**

The expression sustainable development has been used interchangeably as sustainability and sustainable development in Mexico, which has also been the subject of opposing opinions. On the one hand, Gutiérrez and Martínez (2010) state that some authors use them as interchangeable terms that have become paradigmatic with a great presence in political and cultural discourses, characterized by a restricted way of applying them.

For its part, Quadri de la Torre (2006) uses the expressions sustainable development and sustainability as synonyms and emphasizes that in sustainable development an economic thought underlies, based on the existence of an inevitable association between the economy and environmental sustainability, which is It derives from a logic of thought that has its antecedent in environmental economics.

Similarly, Leal Filho (2015) uses the term sustainability as a synonym for sustainable development, while Lozano, Lukman, Lozano, Huisingh and Lambrechts (2013) title their study as follows: Declarations for sustainability in higher education. On the other hand, López (2008) uses the term sustainability as the equivalent of sustainability, while for Almagro (2009) sustainability has a different meaning of sustainable development, since the first is related to ecology and society (the survival of the human being as a species , the sustainability of a family) and the second is applicable to socioeconomic development. In addition to this, Bermejo (2014) warns of other adhesions that prevail around the term sustainable development, such as the idea of a green economy or growth.

According to Ramírez and Ramírez (2014), the Anglo-Saxon term sustainable is used in most discourses, although they affirm that sustainability and sustainable development

connotes two different things. The first is linked to ecology and the sustainable management of natural resources, since it is identified with the social stage and survival of the human being. In addition, they affirm that sustainability is conceived in terms of exercising a process of exploitation of natural resources in a more harmonious way. Instead, “the term sustainable development, sustainable or enduring, is applied to socio-economic development” (p. 51), as mentioned before.

Based on these ideas, it can be indicated that sustainable development is associated with a process, while sustainability is related to the state to which one wants to reach, where a relationship of harmony between human beings and other forms of life on the planet must prevail.

Even so, Paniagua and Moyano (1998) note that the English term sustainable is often used interchangeably in Spanish as sustainable and sustainable. In fact, Gutiérrez and González (2010) use it as synonyms and affirm that the term sustainable development has been better accepted in the legal context in Mexico. This can be confirmed in the public policy implemented, named Strategy of environmental education for sustainability, which refers to the expression sustainable development as it was defined in the framework of the Decade of Education for Sustainable Development (Ministry of Environment and Natural Resources [Semarnat], 2006). In short, the terms sustainability and sustainable development have been adopted practically worldwide as guiding principles of public policies (Paniagua and Moyano, 1998).

However, for the purposes of this essay, sustainable development is understood as an enduring process (and not an end) that seeks to satisfy the needs of the present without compromising those of future generations. For this, it is based on the social, economic and environmental dimensions, which are closely interrelated. Within the social dimension, it is possible to contemplate what is related to culture and politics.

### **Environmental education**

Environmental education (EE) was positioned worldwide as an approach that questions the economic development model that seeks the irrational exploitation of natural resources and environmental pollution. This is a successor concept to the term ecodevelopment, used in the 1970s and promulgated within the framework of the Intergovernmental Conference on the Human Environment (Unesco, 1977).

EE, as a concept and as a discipline, began to develop at the same time that divergent interpretations were being created that generated radical positions; On the one hand, the



belief in this concept implies fully defending natural resources with a very reductionist and entirely naturalistic approach (González and Arias, 2015; Novo, 2009; Sauvé, 2010). On the other, it considers social, economic and political aspects (Boada and Toledo, 2003; Sauvé, 2013).

However, EE —as a process— allows the transformation of the student through the development of values, skills, attitudes and behaviors to act in favor of their environment and seek new styles of development (Novo, 2003; Unesco and Pnuma, 1975 ). In the words of Calixto, Herrera Reyes and Hernández Guzmán (2008), EE is “an emerging field complementary to ecology, oriented towards the formation of skills and attitudes to understand the relationships of human beings with their environment” (p. 13).

Similarly, Cañal, García and Porlán (1958) describe it as the process that allows understanding the interdependence relationships established between society with its mode of production and its biophysical environment. For Boada and Toledo (2003), EA has a common objective: “To be an indispensable instrument for global change. Furthermore, they argue that environmental education should be a political and ethical project of social transformation ”(p. 98).

For his part, Guevara (2013) argues that “the mission of environmental education is to induce a new society-nature relationship, assuming a more critical position, recognizing the concept as a political-pedagogical and historical process” (p. 235). This author argues that the social function of education is the transformation of thought and the generation of knowledge towards a new logic of ethics, solidarity and cooperation, and adds that part of EE interventions should be aimed at specific problems and local, without leaving aside the universal.

For Sauvé (2013) EE integrates closely linked political, ethical and critical dimensions, and affirms that “education and the environment are public matters, objects of collective management” (p. 58). In accordance with this, its incorporation into the university curriculum should be promoted by institutional and public policies that encourage this process.

For his part, Noguera de Echeverri (2013) argues that EE should be understood “not as a chapter of education in general, but as an alternative education proposal” (p. 87). In this regard, Batllori (2008) points out that the development of EE is an emerging area that should be legitimized in the field of education in general and as a field of knowledge in universities.

Currently, various public universities in Mexico offer undergraduate and graduate programs whose objective is to train professionals to teach sustainability at all educational levels.

Considering EE as an alternative educational approach to other teaching models, Matos and Flores (2016) emphasize that it is based on the following principles: a) it includes the interrelationships of all the factors that influence the environment; b) uses participatory methodologies; c) it is practical and promotes a relationship between the reality of the students and the teaching-learning process, and d) it is valuable, since it implies restoring a relationship of respect with the environment. Likewise, González-Gaudio and Puente-Quintanilla (2010) point out that EE contemplates, from its pedagogical perspective, to train people to critically think about socio-environmental issues.

According to this idea, the human being is at the center of the EE process, since he is the main actor in changing the unsustainable development model. Indeed, training future professionals with values is crucial to counteract social and environmental problems, hence it must be transversal in all areas of knowledge in the country's public universities.

On the other hand, Arias (2010) criticizes the fragmented views that prevail around AD:

The teaching of natural sciences, in which it privileges the transmission of information and references oriented to the biophysical processes of nature, has neglected or ignored the other important aspects that are interrelated such as the social, political, economic, technological, cultural dimension and ethics, which are constituted as an inherent part of environmental problems (p. 222).

The different visions to define EE marked a milestone to propose a new perspective that was not limited only to nature conservation, but that socio-environmental problems were understood taking into account a broader vision with different approaches.

According to Bifani (2013), EE has evolved, starting from a conception oriented fundamentally in the preservation and conservation of the environment towards a conception linked to sustainable development (environmental education for sustainability [EAS]). Likewise, he points out that the EAS should contribute to changes in attitude, behavior and consumption patterns.

In this sense, the EAS concept has been used in Mexico as a front towards the education for sustainable development (ESD) concept. According to Batllori (2008), this new term is adopted for the following reasons: a) it promotes the formation of individuals with the knowledge, skills, feelings, values and behaviors that favor the construction of an



alternative social paradigm characterized by patterns of social coexistence, b) it can support political, economic and ecological sustainability, and c) it relies more on sustainability than on sustainable development.

### **Environmental education and greening of the university and campus curriculum**

Environmental training and the greening of the curriculum are two concepts that have been linked to the field of higher education. Regarding the first, according to the National Association of Universities and Institutions of Higher Education [Anuies] and the Secretariat of Urban Development and Ecology [Sedesu] (1990), environmental training has to do with “the design, content, methodologies, work on specific problems, research, framework of action, etc., which can facilitate the study of certain environmental aspects to be taken into account in university training” (p. 7).

For his part, Arias (2010) affirms that environmental education and environmental training are two concepts with the same idea. He points out that “the main objective of environmental training is to provide professionals at the higher level with the essential theoretical-practical elements to understand, analyze and reorient their professional work from an environmental perspective” (p. 187). However, Coya (2000) points out the following: “Both concepts are often used as synonyms, this is because in international frameworks more emphasis has been placed on environmental education and less importance to explain environmental training” (p. 108).

Environmental training is made up of two dimensions: on the one hand, the formation of values and attitudes and, on the other, the acquisition of knowledge and technical-scientific skills related to work activities (Coya, 2000). The distinction between environmental training and environmental education is an idea also supported by Molano and Herrera (2014), Coya (2000) and Arias (2010).

For their part, Ángel and Ríos (2014) consider that “environmental training in the university implies considering the three classic functions: teaching, research and social projection [extension], without leaving university management aside” (p. 64); They also point out that environmental training is a strategy contemplated in environmental education.

Leff (2002) explains that environmental training, understood as a process, questions traditional teaching methods and poses new challenges for the transmission of environmental knowledge. In addition, he points out that this term implies the production of new knowledge

and recovering the critical, prospective and purposeful function of knowledge to create a new social rationality.

On the other hand, the greening of the curriculum is a concept that is based on the principle that in the field of universities the university community cannot be considered as an isolated element of society. According to Junyent, Bonil and Calafell (2011), curricular greening should meet the following characteristics: a) approach from complexity; b) curricular flexibility; c) contextualization; d) take into account the subject in the construction of knowledge, e) consider the cognitive and action aspects of people, f) coherence and reconstruction between theory and practice, g) prospective orientation of alternative scenarios, h) methodological adequacy, i) generate spaces for reflection and democratic participation, and j) commitment to the transformation of society-nature relations.

Regarding the greening of the university, it includes the application of an environmental management system that favors and enhances the participation and involvement of a university community, where the substantive and management processes are closely related dimensions (Benayas et al., 2002). Likewise, according to Benayas et al. (2002) “it would be difficult for an environmental management of the university to work if it is only executed by the staff and the active participation of the entire university community [teachers and students] is not encouraged” (p. 5). The authors' argument is supported by this idea because the university community follows the same guidelines and trends that can be found in the society where it is immersed (Benayas et al., 2002).

According to this concept, three main dimensions are understood: a) an environmental management model, b) the involvement of extracurricular activities that allows the university to connect with students beyond the curricular content through voluntary and collective participation in programs, campaigns and projects with society, and c) the offer of study programs and specialization courses in environmental matters and encourage the offer of credits for extracurricular activities, in the sense of making academic what was previously extracurricular, complementing their training with environmental activities and content (Benayas *et al.*, 2002).

Educational institutions, therefore, have the obligation to establish environmental management systems that are consistent and that allow students to learn by example (Moreno, Barrientos and Johnson, 2009). According to Wright (2002), the institutional policies adopted by universities share common principles and themes, namely: sustainable physical operations, academic research on sustainability issues, the development of an

interdisciplinary curriculum, ecological literacy, and outreach and inter-institutional cooperation. In the same way, Wright (2002) points out that the real challenge for universities does not lie in signing their commitment to sustainability through a policy or commitment, but in how it is understood and applied by the university community in its substantive and communication processes. management.

In short, the incorporation of the environmental perspective in the field of formal education demands a transformation in academic practices to develop in students the principles related to environmental training. In addition, universities must be consistent with this commitment through the application of strategies such as campus greening, among others.

### **Eco-pedagogy**

Ecopedagogy (alternative approach to environmental education and also known as pedagogy of the earth) is a movement that questions the neoliberal development paradigm, suggesting a change to consider the planet as a single community (as a system) where reduce social and economic inequalities, and where the integration of the cultural diversity of humanity is promoted (Gadotti, 2003).

According to Abril-Hervás (2015), it is a process that is based on the promotion of values and ethics, as it tries to train people with a critical sense who oppose a capitalist logic that is enriched by natural resources without import their predation. This movement — proposed as an alternative pedagogy— aims to be different from other paradigms, since it takes into account not only the preservation of nature, but also the creation of a new model of sustainable civilization. Therefore, for Gadotti (2003) this approach is broader than environmental education.

According to this vision, the education process gives people the ability to choose and act in favor of improving their quality of life, hence others cannot decide for it. This means that through the education process, people can change unsustainable behaviors (Dimas-Sánchez, Peña-Moscoso and Herrán-Bocanegra, 2017) for environmental values and principles (Zingaretti, 2008). Ecopedagogy, therefore, must be a transversal element in the teaching process (Fuentes and González, 2016) to create an ecological awareness in people (Antunes and Gadotti, 2006).

This term, therefore, questions the way in which natural resources are overexploited, so it is based on the training of people to stop the deterioration of the planet. However, the difference between ESD and eco-pedagogy is that in the latter, development and the use of



natural resources are perceived as a dichotomous relationship, that is, they cannot coexist in harmony.

### **Biopedagogy**

While eco-pedagogy and environmental training emphasize the importance of formal (schooled) education, environmental education and biopedagogy are approaches that recognize, of equal importance, people's out-of-school education. Biopedagogy, therefore, is based on the principle that "education occurs in everyday, formal and informal relationships" (Pabón et al., 2005, p. 49).

For his part, Berdugo (2013) adds that it is a process in which people acquire knowledge through other forms of life. That is, biopedagogy is a term that is based on the fact that people are formed in the same activity of daily life.

According to the concept of biopedagogy (where bio refers to 'life' and pedagogy to 'teaching-learning process'), it is understood that this is a type of training that transcends formal education. In this sense, Romero (2012) affirms that knowledge can also be achieved in forms of knowledge based on experience and other cultures. According to Patarroyo, Guerrero, Rincón and Vargas (2011), this concept includes "new forms of relationship of human beings with themselves, with nature and with the other" (p. 12).

### **Education for sustainable development**

Education for sustainable development (ESD) is an alternative approach to the visions described above that is based on the principles that characterize sustainable development. This constitutes an innovative educational model, compatible with knowledge societies (Unesco, 2005); For this reason, it is opposed to the traditional model that is sustained in disciplinary training and that satisfied at the time an industrialized society characterized by the specialization of work and the exploitation of natural resources.

According to Ruiz, Martínez and Valladares (2010), new and diverse forms of social, cultural, economic and political organization underlie the knowledge society, where knowledge is the constitutive feature of a social reality. According to this position, universities should adapt and respond to the constant changes that disturb their work, such as globalization, knowledge societies and the knowledge economy (Clark, 2001).

Since the establishment of the United Nations Decade of Education for Sustainable Development enacted in December 2002, different ways of understanding and applying this concept have prevailed. For example, Bravo (2008) states that in many regions an amalgam

was made between these ESD guidelines and the notion of environmental education, hence they are the main approaches that guide the strategies implemented by the country's public universities.

On the other hand, Heidt and Lambertón (2011) state that ESD contemplates five main aspects: vision towards the future; critical and reflective thinking; participation and decision making; collaboration, and systems thinking. The fact that the authors decide to adopt the term sustainability education as a synonym for ESD is, according to them, because it is a concept that occupies a privileged place in Australian legislation.

According to Biasutti, Makrakis, Concina and Frate (2018), the importance of developing sustainable competencies and the principles of sustainable development (SD) in teachers and students lies in inducing a change in their attitudes to solve current problems. The principles of sustainability include a) a holistic approach, b) interdisciplinarity, c) an approach based on learning, d) experiential and meaningful learning, e) consider multi-methodological principles, f) the formation of values and ethics, g) participation in decision-making, h) interconnect the local with the global, and j) apply locally relevant and culturally appropriate criteria (Biasutti et al., 2016).

In this sense, ESD contemplates interdisciplinary training and a student-centered approach, which is why it is transversal for all study programs, which must reflect as part of the learning results not only the knowledge of a discipline, but also skills related to sustainable development.

The fact that this approach questions other views is mainly due to the fact that sustainable development problems cannot be addressed from a single discipline. According to Svanström, Lozano-García and Rowe (2008), a curriculum that incorporates sustainability is not only limited to the transmission of knowledge about ecosystems and the human condition, but also to ensure learning outcomes that include the development of interpersonal and intrapersonal skills, as well as systems thinking.

For their part, Biasutti, De Baz and Alshawa (2016) highlight that the teaching of sustainability can be strengthened with the use of learning strategies such as lectures or lectures, small group discussions, individual work, simulations, case studies, game of roles, experiential learning activities and collaborative work.

The Agency for Quality Assurance [QAA] of higher education in the United Kingdom recognizes that ESD contemplates the adoption of teaching and learning approaches, such as an interdisciplinary perspective, learning based on experience and interaction, critical

reflection, meaningful learning based on learning with real-life problems and situations, and participatory and peer learning (QAA, Higher Education Academy, 2014).

The adoption of the ESD approach requires changing traditional education models that privilege disciplinary training with very little flexibility. Instead, it suggests models based on the formation of competencies that allow, together with those of a discipline, the graduation of future professionals who can contribute to economic, social and environmental development. According to Gradilla (2017), an education based on the development of sustainable competencies "allows students to obtain the knowledge, skills and values that they will gather in their personal life and professional future to face the challenges of sustainability" (p. 31 ).

Therefore, the incorporation of the ESD approach in the curriculum represents a process that is not without tensions between the ways of understanding its scope and its application by teachers in their academic practice. In other words, this form of alternative education demands a set of principles, concepts, and practices that can be used to help students, teachers, and managers understand sustainable development.

## Discussion

The country's public universities, as complex organizations, are challenged to understand and implement the principles of sustainability within the university curriculum as part of their commitment to the 2030 Agenda and the goals for sustainable development. This challenge implies knowing the way in which they are understood and used by the different actors of the university community. Likewise, and given that sustainable development is a holistic concept that does not concern a single discipline, the active participation of all university actors is required to facilitate its implementation.

In this sense, it should be taken into account that the current structuring that characterizes the country's public universities —based on the departmentalization of knowledge— contributes to the fragmentation of science, a reality questioned by ESD, which invites the reconciliation of the different disciplines to contribute to the design and development of new theoretical-methodological models that allow us to respond to the challenges faced by sustainable development.

As already mentioned, the ESD approach is a supranational benchmark that arises from the consensus of the countries, despite their economic, social and environmental

differences, hence contingency factors force organizations to transform and adaptation; therefore, supranational decisions would correspond to a contingency factor that affects the country's public universities.

For their part, Olaskoaga, Marúm, Rosario and Pérez (2013) affirm that higher education institutions (HEIs) have a traditional bureaucratic structural configuration that hinders the changes required to respond to environmental problems. Therefore, the authors argue that the model that best fits in the work of the universities is the one that corresponds to the adhocracy, which resorts to the spontaneous coordination of teachers to create a culture based on recognition, which fosters the capacity of learning and innovation.

In accordance with the foregoing, it is essential to promote university management that is based on the participation of teachers to facilitate the incorporation of sustainability in all study programs. Indeed, in the university context, the teaching staff is a key actor in developing the particular competencies of a discipline, as well as the general ones, which are reflected in the development of systemic thinking and a vision for the future. Therefore, for Cebrián (2020) “institutional support and leadership must create a learning community where existing good practices are identified, the exchange of educational resources is promoted and support and guidance from experts and facilitators is available” (p 111). In other words, while teacher training and updating are a key aspect for developing the competencies required by ESD in students, so is their participation in the design of institutional strategies so that universities can contribute to their mission and to sustainable development.

In short, the challenge for university management is to promote teaching updating and development programs, as well as to develop leadership in the teaching staff that enables the transformation of the student as an agent of change in the solution of environmental problems. (Zúñiga-Sánchez, 2019).

## Conclusions

Establishing the perspective of ESD in higher education is a pending task. For this reason, the purpose of this essay was to outline crucial aspects that can serve as a guide for managers and decision-makers of university policies in the process of incorporating the perspective of sustainability into the university curriculum. For this, however, the forms of structuring maintained by the country's public universities must be considered, since ESD requires that these institutions update their educational and academic model to contemplate this perspective, and with this achieve a genuine interdisciplinary training that facilitates dialogue between disciplines as a necessary condition to solve the problems demanded by sustainable development. Precisely, a quality education includes the application of methodologies proposed by the ESD to guarantee the relevance of higher education with knowledge societies.

Finally, as previously stated, teachers need to assume an active role in the process of implementing the perspective of sustainability. The challenge of university management, in short, is to establish structural mechanisms that promote distributed leadership, facilitate communication and encourage participation and involvement of teachers in the design of institutional strategies.

## Future lines of research

Although in this essay the different sustainable perspectives that have emerged to contribute to the field of knowledge of higher education and the perspective of ESD were discussed, there is still a lack of empirical approaches that allow to account for the way in which sustainability it is understood and applied by managers, teachers and students in the context of higher education. Likewise, the impact of factors related to the professional profile of university internal actors should be studied.



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