

Article

Environmental Education for Sustainability in Higher Education Institutions: Design of an Instrument for Its Evaluation

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Abstract: Higher Education Institutions (HEI) play a fundamental role in the transition towards Environmental Education for Sustainability (EES). As a consequence, one of the most critical challenges is the need to know their level of incorporation into the environmental agenda. Therefore, an instrument was made and validated to determine the level of incorporation of Environmental Education for Sustainability into the environmental agenda of HEIs. For its construction, the dimensions of Institutional Identity, Teaching, Research, Extension/dissemination, and Linkage were considered, relying on a total of 17 items. Its validation was carried out through an expert review and expert judgment, and a pilot test was carried out to adapt it to the target population. The main result was an instrument that integrates the substantive and procedural functions of HEIs. Following the expert review, the instrument was improved according to their suggestions. The expert judgment showed an adequate content validity (Aiken's $V > 0.80$; $LL > 0.60$). The pilot test also suggested that the understanding of instructions and items was adequate with an optimal value of internal consistency (Cronbach's α of 0.862). An instrument that determines the level of incorporation of the EES in the substantive and procedural functions of HEIs is presented, valid in content, and with adequate levels of clarity and understanding of the target population.

Keywords: pilot project; environmental agenda; qualitative analysis; substantive and procedural functions



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1. Introduction

Environmental Education (EE) is defined as the educational and cultural process through which subjects build knowledge and develop capacities, attitudes, and values that allow them to understand the environmental and socio-cultural reality in order to establish a responsible relationship with the environment and implement actions to address environmental problems [1]. That is why EE has been fostered as a benchmark in the pedagogical and institutional field [2]. However, the solution to current environmental problems is not only a matter of technical or pedagogical aspects, but it must also transcend beyond classroom education and consider wider educational spaces where the subjects can influence and can also be influenced [3,4]. In this context, the EE must be articulated with other fields of knowledge and have a multi-referential approach [5].

Over time, the definition of EE has been transformed and has progressively extended its objectives towards the sustainability of development, considering, above all, the new challenges of the 21st century [6]. This has resulted in the approach of an environmental education for sustainability (EES), which has the implicit idea of profoundly transforming attitudes and promoting basic principles so that human beings can be more aware of their own existence and their role in the natural environment [4,7–9]. With these ideas, it is

hoped to achieve the promotion of more just and equitable development, as well as the solution to conflicts and diverse interests, with particular attention on health, peace, nature care, and the prevention of socio-environmental disasters [7,8].

Given the current context of the work, EES is contextualized as a permanent learning process based on respect for all forms of life and on a fundamental social commitment to the environment. This process promotes the transmission of knowledge and incorporates new educational challenges and characteristics, such as innovative critical thinking, local and global awareness, value-based education, holistic vision, cooperation, and interculturality [10–12]. It also involves a vision that promotes the training of responsible and committed people to contribute to more sustainable, just, and equitable societies [2,13,14].

Higher Education Institutions (HEI) are fundamental for the development of a country, since their central or substantive functions, such as teaching, research, and dissemination, not only contribute to the training of professionals in different branches of knowledge but also preserve, create and transfer the assets of culture that are concerning to social interest [15]. However, since the mid-twentieth century, one of the challenges that HEIs have faced is understanding and solving the environmental crisis for sustainable, social, and economic development [14]. To face this challenge, HEIs search to promote positive attitudes with the curricular environment-making process towards greening from different scopes through their substantive functions [16], thereby achieving an Environmental Education for Sustainable Development (EES).

Although there are different contributions and experiences of the HEIs to promote environmental sustainability, there is still debate on the parameters and indicators that should be measured e.g., [17,18]. Some authors such as Leal [14], Berdugo and Montaña [19] suggest that HEIs should improve the integration of EES in their substantive and procedural functions, so they should adopt a comprehensive and multidisciplinary approach in all of its components; facilities, campus operations, community ties, institutional framework, among others. Given the high level of responsibility of HEIs to promote the protection of the environment, their objectives, strategies, and institutional and inter-institutional mechanisms of EES must be clear for the benefit of the academic community and society with which it is linked [11,19,20].

In particular, the substantive functions of an HEI that make up the fundamental pillars of university work are, due to their importance, teaching, research, and linkage, under the understanding that they contribute to achieving the objective of higher education [15]. On the other hand, the procedural functions of identity (management), extension, and dissemination improve the quality and efficiency of the substantive functions of the institution.

The development of instruments that assess the incorporation of EES in HEIs is essential for UNESCO's 2030 agenda [2,21]. However, given the different approaches and theoretical background, there is no consensus on which tool is more useful or better [17,22], for example, the most common instruments are questionnaires, reflective journals, and interviews [16]. Some are explicitly aimed at students to assess environmental attitudes [22–24] and others at the perception of teachers or knowledge [25–27]. In other cases, the use of methodologies is oriented towards the physical space of HEIs [28] or through the identification of environmental indicator systems as is suggested by [29,30].

At an Institutional level, few research studies have been conducted that analyze the substantive and procedural functions in HEIs e.g., [14,19], and only the set of indicators of Súcar and Palomino [30] address the substantive functions from the particularity of Mexican HEIs whose context requires a comprehensive approach to environmental issues. Therefore, the objective of this work was to build and validate a diagnostic instrument to determine the level of incorporation of the EES in the environmental agenda of the main functions of the HEIs whose contemplated dimensions and indicators are relevant to the Mexican context.

2. Materials and Methods

The type of study was instrumental, which consisted of the development of tests/instruments and the analysis of their psychometric properties [31]. In this study, an instrument was made and its psychometric properties were analyzed, as shown in Figure 1.

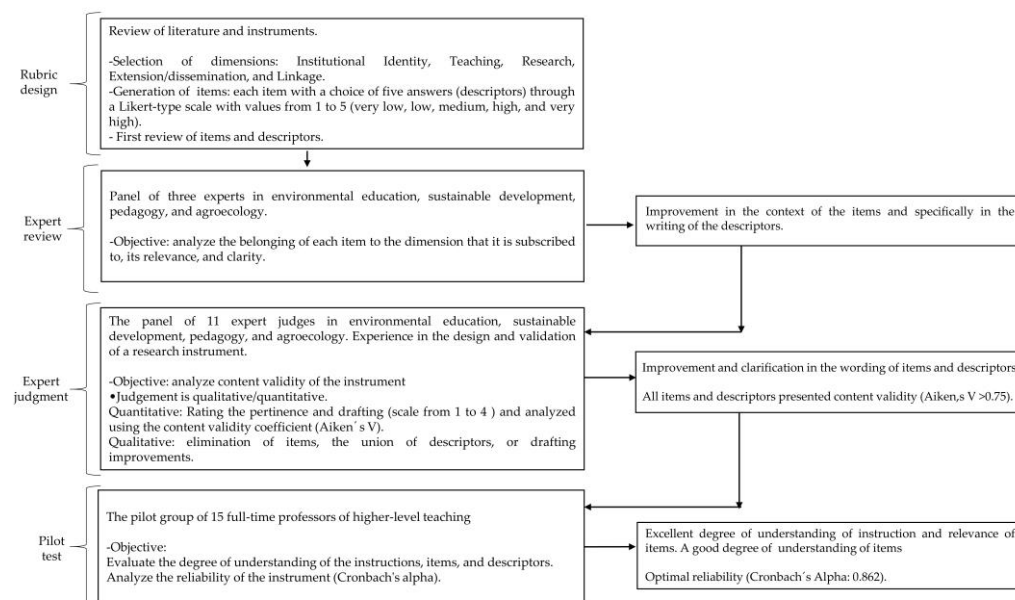


Figure 1. Methodology flow chart.

2.1. Design

For the design of the instrument, a review of the instrumental antecedents of the EES in the HEIs was carried out, highlighting the works of Biasutti and Frate [22], Esteban and Amador [32], Cury et al. [25], García, Jiménez and Azcárate [26], Junyent, Bonil, Calafell [27], Martínez et al. [28], Muñoz and Páramo [29]. However, since they do not fit the context of interest of this work, the set of indicators of the Mexican Consortium of University Environmental Programs for Sustainable Development (commonly known as COMPLEXUS in Spanish) [30] was considered as a base reference.

After reviewing the instruments, for their elaboration, five dimensions or functions were considered. Three were substantives functions (Teaching, Research, and Linkage), and two were procedural functions (Institutional Identity and Extension/dissemination) of HEIs. Each dimension was made up of items and each item had a choice of five answers (descriptors) through a Likert-type scale with values from 1 to 5 (very low, low, medium, high, and very high).

This instrument was made to analyze the incorporation of the EES in the functions of HEIs; therefore, the research was oriented towards full-time professors (FTP). It was considered that FTPs are not only teachers but also researchers who had other activities as well. For this reason, it was assumed that they had a broad vision and knowledge in the dimensions of the instrument and their HEIs.

2.2. Expert Review

Once the first version of the instrument was concluded, it was submitted to the review of three experts whose relevant characteristics linked them with the studied problem, as well as their professional experience, personal qualities to participate in the research, and professional expertise [33]. The experts had to have at least a minimum academic degree of a master's degree and experience in the design and validation of research instruments [31,34]. According to this mentioned above, the group of experts was made up of three FTPs with an average experience of 14.33 years (± 9.01) in environmental education, sustainable development,

pedagogy, and agroecology. The review's objective was to analyze the belonging of each item in the dimension to which it is subscribed, its relevance, and clarity.

2.3. Expert Judgment

Expert judgment has been considered as the optimal way to determine content validity [31]. It consists of an informed opinion of people with ample experience of a particular subject to provide information, evidence, judgments, and evaluations on the evaluated topic [31]. For the content validity analysis, the instrument was submitted to the evaluation of 11 experts. Like the expert review, they were selected according to the field of expertise, academic degree, and experience in designing or validating instruments.

The judgement had a qualitative/quantitative approach [31,34,35]. The scale of Expert Judges [36] was used, which contemplates a qualitative evaluation considering the elimination of items, the union of descriptors, or drafting improvements. For the quantitative evaluation, a scale from 1 to 4 analyzed the relevance and writing of each item and its descriptor in the answer options.

The quantitative evaluation was analyzed using the content validity coefficient V of Aiken and its confidence intervals of 90% [37], denoting that to consider an item as valid, the value of the coefficient must be greater than 0.75, as well as a higher value of 0.5 in the lower limit of the confidence interval [37,38].

2.4. Application of the Test with a Pilot Group

After the judgment and improvement of the instrument, the analytical rubric was applied to a pilot group of 15 FTPs of higher-level teaching, of which eight professors have held a management position within the HEIs. The application form was an electronic form using google forms. The objective of the pilot group was to evaluate the degree of understanding of the instructions, items, descriptors, and the answering time of the instrument. For this purpose, the satisfaction survey with the instrument [39] was used, and the reliability of the instrument was evaluated using Cronbach's alpha coefficient [40].

3. Results

3.1. Design and Review by Experts

The emitted evaluation concerned the definition and clarity of concepts implicit in the instrument, which led to a literature revision for some definitions shown in Table 1. Also, considering that the instrument addresses a topic of relevance for HEIs. The pilot group evaluated the degree of understanding of the instructions, items, descriptors, and the answering time of the instrument.

3.2. Expert Judgment

The evaluation carried out by these experts provided suggestions for improvement and clarification in the wording of items 1, 3, 4, 6, 8, 9, 10, 11, and 12. They also suggested changes in the assessment scale of some descriptors of Items 2, 3, 5, and 10, where the high and very high levels were perceived as confusing (Table 2).

The analyzed qualitative evaluation with Aiken's V showed that, for relevance, 82% of the items presented optimal values (Aiken's $V > 0.80$; $LL > 0.60$) (Figure 2a), while for items 1, 4, and 8, they showed values close to the established minimum (Aiken's $V = 0.78$; $LL > 0.50$) (Figure 2a). These items were improved from the observations of the expert judges (Table 2). On the other hand, for the writing criterion, 100% presented optimal values (Aiken's $V > 0.80$; $LL > 0.60$) (Figure 2b).

Table 1. Revision of concepts related to EAS.

Concept	Definition	Source
EES	EES aims to achieve social justice for current and future generations while respecting cultural diversity. It is about lifelong learning, and it is part of a quality, comprehensive and transformative education under the dimensions of content, pedagogy, learning environments, and social transformation.	[2]
Sustainable development	Dynamic concept with multiple forms of interpretation according to different perspectives; however, an emphasis should be placed on the holistic approach integrated by three dimensions: the environment, the economy, and society.	[41]
Performance Indicators	They constitute a set of elements whose capacity allows for the generation of a synthetic image of the conditions of a study site. They make up a set of criteria that directly assess a non-tangible reality but they articulate and correlate variables and must fulfill the function of simplifying a complex phenomenon and quantify and produce information about such phenomenon.	[29,30]
Curricular Environmental Transversality	Curricular strategy through which high priority topics are inserted into an educational program, permeating activities, content, and practices throughout the curriculum to articulate the disciplines and achieve a holistic training process.	[9,41]
Curricular greening	Integrating an environmental dimension in the Institutions is related to how the HEI incorporates the environmental issues from different institutional settings: training, research, extension, and management.	[27,42,43]
Substantive functions	They are elements that guide HEIs to achieve their social responsibility through the relationship between their mission and work efforts that they jointly carry out; they constitute university work through research, teaching, extension, or social projection.	[15]

Table 2. Observations and suggestions of the items by the judges, as well as the corresponding improvements.

Judge	Item/Descriptor	Suggestion	Item/Descriptor Improvement
3, 10	Item 3. To what degree does the HEI have mechanisms for promoting environmental awareness within it as part of its daily practices?	It is a performance indicator that encompasses the system of elements to promote environmental management adequately. Take into account that promoting environmental awareness is different from just promoting saving resources. The wording can be improved to avoid confusion.	3. To what degree does the HEI implement an Environmental Management system to promote environmental awareness to the entire academic community?
3	Item 4. To what degree does the HEI have a civil protection program, prevention of risks to the health, environment, and heritage?	It is necessary to incorporate management, treatment, and disposal of hazardous waste from laboratories.	This suggestion was incorporated in item 3 within the descriptors.
5	ITEM 5. To what degree does the HEI incorporate education, in a mainstream environmental way, for sustainability into its study plans?	Check the wording in descriptors, sounds confusing	The very high descriptor was improved as follows: At least one PE has the environmental and sustainability dimension in a mainstream environmental way in all its subjects, and the HEI also has a program for the training of its teachers to address the mainstream in an environmental perspective and the sustainability in all its educational programs.
5	Item 6. Very high-level descriptor. There are teacher training covenants, graduate programs, specializations, or postgraduate degrees that are permanently offering preparation from environmental pedagogy to formulate didactic strategies for the educational processes in which they intervene.	Improve wording	The HEI has an evaluating and monitoring program for its trained teachers through its environmental and sustainability issues.

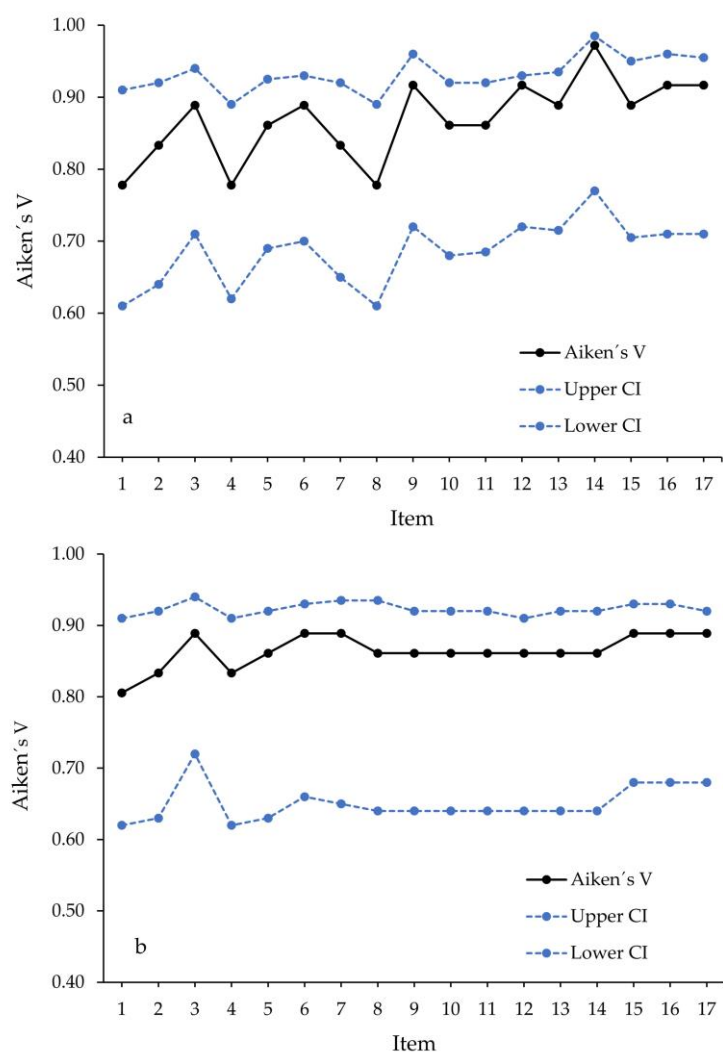


Figure 2. Values of Aiken's V and the lower and upper values of the confidence interval for each item in the criterion of relevance (a) and writing (b). CI, confidence intervals.

3.3. Application of the Instrument to a Pilot Group

The results revealed that both the understanding and relevance of the items and the degree of satisfaction were excellent. On the other hand, the degree of understanding of the items was also good (Figure 3). Regarding internal consistency, an optimal reliability value was obtained (Cronbach's Alpha: 0.862). Table S1 provides the final version of the instrument.

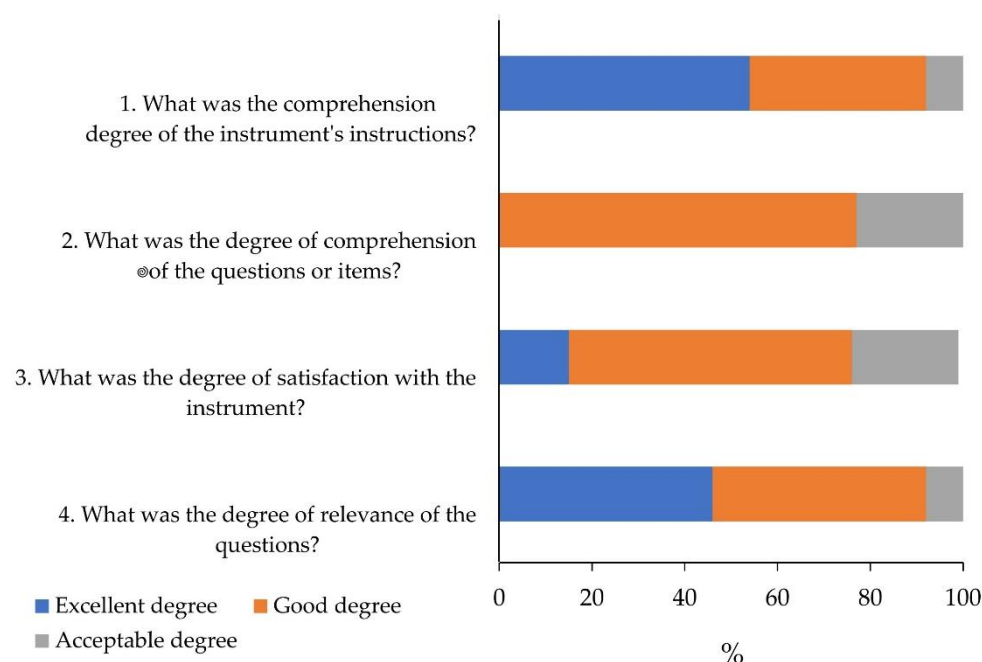


Figure 3. Results obtained from the satisfaction survey.

4. Discussion

Currently, there is no consensus on a specific framework of key sustainability competencies and their inclusion within the EES in higher education institutions [44] so having an instrument that serves as a guide and reference for curriculum development or reorganization of HEIs constitutes an essential step to determine the level of incorporation of the EES in the substantive functions of the HEIs.

The degree to which EES is incorporated in HEIs constitutes a complex task [15]. In this work, various study approaches of the EES are reported, whose contribution contributes to a methodological framework to improve the understanding of the subject, either from the perspective of the students [22,23,25] to the teachers [25,26] or the administrative field [28]. Therefore, five dimensions were included in the instrument designed here, all related to the substantive functions of the HEIs. Each dimension seeks to obtain in greater detail the elements that describe the context of the EES and takes as a starting point the proposal of the COMPLEXUS indicators, which considers a university system, interrelated, articulated, complementary, in a complex and systemic way [30].

Due to its importance in university work, teaching represents a fundamental pillar of higher education [15], where teachers pose various challenges in the evaluation of EES in HEIs since it can be oriented towards knowledge or perceptions, with a pedagogical approach under the premises of systemic thinking, interdisciplinary work, personal participation, strategic action and critical thinking [13,18]. For this reason, the instrument considered a general dimension on teaching to address teachers and academic programs at a transversal and multidisciplinary level from an environmental and sustainable perspective.

Thus, curricular environmental transversality and the environment can be associated through the insertion of high priority topics permeating activities and content throughout the curriculum, also considering the articulation of disciplines [43,45], and integrating the environmental dimension in the curriculum from different institutional settings [27,46–48].

Additionally, research as the second fundamental pillar in HEIs [15] performs a preponderant role in creating and disseminating knowledge. In this context, our instrument analyzed the development of practical skills, types of collaborations, and aspects of critical and systemic thinking, problem-solving, and capacity for action, as suggested by Esteban and Amador [23] and Esteban et al. [32]. Also, we considered aspects of local and traditional knowledge, the link between students, teachers, social or government sectors, and the application, innovation, and technology transfer.

In this work, the instrument incorporated the Institutional Identity as a procedural dimension, which dealt with the importance of the environmental agenda and the sustainability approach under its institutional policy. For example, their strategic plans, institutional regulations, and budget allocation with approaches in each administrative activity's environmental agenda and sustainability. It also incorporates various aspects of comprehensive waste management, responsible use of water and energy, green purchases, construction, sustainable construction, and mobility, among other issues and those related to the Environmental Management System.

The instrument's structure consists of descriptors obtained from indicators based on levels ranging from the lowest to the highest of performance. This structure allows having an instrument in the form of an analytical rubric, which contains the three implicit elements of a rubric: evaluation criteria, quality descriptors, and levels of achievement [49]. This provides a greater specificity at the level of each item and serves as support so that the participants can orient themselves in their answer and have the potential to gather more detailed information through its components.

An essential aspect in the development of instruments is the analysis of their psychometric properties since it is a crucial criterion to determine their measurement quality [50]. In this sense, validity and reliability are essential properties that evaluate the precision of an instrument. However, only the contributions of Esteban and Amador [23], as well as García, Jiménez, and Azcárate [26], refer to the execution of expert judgment to determine content validity. Therefore, expert review after its construction ensures their validity and determines the items' belonging and relevance to the theoretical construct [51–53]. Sufficient elements were obtained from this review to delimit the instrument's dimensions and the total number of items to be considered and that they belong to each dimension in a concise and representative manner. Likewise, the expert review improved wording and clarified some descriptors that generated confusion (e.g., budget allocation and transversality in the curricula). Thus, the importance of this analysis is highlighted.

On the other hand, content validity indicates the degree to which the elements of the instrument are relevant and representative in a theoretical construct evaluation [53–55]. In this work, validation made it possible to clarify and identify the dimensions and items or aspects their properties required. Also, it is necessary to demonstrate their pertinence and relevance, which were applied through the judgment of experts, considering optimal analysis to determine content validity [31,34,35,52,54]. The results showed a content validity of all the items, and the suggestions provided greater clarity of various items and descriptors. It also allowed for finding the appropriate wording of the items, with the basic grammar and lexical rules to improve the users' understanding. All the recommendations were pondered and taken into account to specify the final version of the instrument, therefore, it can be established that the instrument has content validity.

Finally, in the application phase to a pilot group, the understanding of instructions and items was denoted, revealing the accessibility or feasibility of the instrument. This was accessible and easy to apply in the field, considering simplicity and clarity when answering the instrument suggested by [50,53]. Furthermore, the high reliability suggests a good correlation between items and a weighting on the theoretical construct addressed [50,56]. Nonetheless, it is essential to recognize that this analysis is still exploratory since it is required to apply it to a sample of more than 200 participants, as is suggested by [57].

5. Conclusions

The debate on EES as an emerging approach still exists at an institutional, social and political level. This work incorporates the EES in the environmental agenda of the main functions of the HIEs. The instrument's design is an analytical rubric that provides essential advantages by having descriptors that favor a better orientation to the user about it. On the other hand, the content review and validation process allow continuous improvement of the instrument and shows that its elements are relevant and representative of the theoretical construct. In this context, this paper presents a relevant and validated instrument to

evaluate the level of incorporation of environmental education for sustainability into the environmental agenda of HEIs.

Although the instrument proved to be accessible for the target population, it is necessary to apply it to a larger population sample to reaffirm this aspect and analyze the construct validity. Finally, and according to the principles of the 2030 Agenda, EES constitutes a fundamental starting point to achieve sustainability goals; in this sense, HEIs have a priority role in the social change that is expected in the long term to protect the environment.

Supplementary Materials: The following are available online at <https://www.mdpi.com/article/10.3390/su13137129/s1>: Table S1: Dimensions, items, and descriptors of the instrument to know the degree to which EES is incorporated into HEIs.

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References

- Salazar, T.d.N.J.M. Educación ambiental para la sustentabilidad (Environmental education for sustainability). *Horiz. Sanit.* **2009**, *8*, 4–7. [CrossRef]
- United Nations Educational, Scientific and Cultural Organization. Educación para el Desarrollo Sostenible. Available online: <https://es.unesco.org/themes/educacion-desarrollo-sostenible/comprender-EDS> (accessed on 23 July 2019).
- González Gaudiano, E. *Educación Ambiental: Historia y Conceptos a Veinte Años de Tbilisi (Environmental Education: History and Concepts Twenty Years from Tbilisi)*; Sistemas Técnicos de Edición: Ciudad de México, México, 1997.
- dos Santos, F.A.; da Silva Leite, E.; Amorim, R.J.R.; Amorim, D.G. Environmental Education in Brazil: Socio-Historical Perspectives in Formal Teaching for Sustainability. *Creative Educ.* **2020**, *11*, 103613. [CrossRef]
- Sierra, C.A.S.; Bustamante, E.M.G.; Morales, J.D.C.J. La educación ambiental como base cultural y estrategia para el desarrollo sostenible (Environmental education as a cultural basis and strategy for sustainable development). *Telos Rev. Estud. Interdiscip. Cienc. Soc.* **2016**, *18*, 266–281.
- Gutiérrez, J.; Benayas, J.; Calvo, S. Educación para el desarrollo sostenible: Evaluación de retos y oportunidades del decenio 2005–2014 (Education for Sustainable Development: Assessment of Challenges and Opportunities for the Decade 2005–2014). *Rev. Iberoam. Educ.* **2006**, *40*, 25–60.
- Marcote, P.V.; Suárez, P.Á. Planteamiento de un marco teórico de la Educación Ambiental para un desarrollo sostenible (Proposal of a theoretical framework of Environmental Education for sustainable development). *Rev. Electrón. Enseñ. Cienc.* **2005**, *4*, 1–16.
- Boca, G.D.; Saraçlı, S. Environmental education and student's perception, for sustainability. *Sustainability* **2020**, *11*, 1553. [CrossRef]
- Juárez Hernández, L.G.; Tobón, S.; Salas Razo, G.; Jerónimo Cano, A.E.; Martínez Valdés, M.G. Desarrollo sostenible: Educación y sociedad (Sustainable development: Education and Society). *M+A Rev. Electron. Medioambiente* **2019**, *20*, 54–72.
- Cañellas, A.J.C. La complejidad del desarrollo sostenible (The complexity of sustainable development). *Misc. Comillas Rev. Cienc. Hum. Soc.* **2007**, *65*, 511–534.
- Rosell Puche, L. Aportes de la educación superior para el desarrollo sostenible: A extensión universitaria y la pertinencia del conocimiento (Contributions of Higher Education for Sustainable Development. The university extension and the relevance of knowledge). *Acta Odontol. Venez.* **2007**, *45*, 346–353.
- Batlloori, A. *Environmental Education for Sustainability: A Challenge for Universities*; National Autonomous University of Mexico: Cuernavaca, México, 2008.
- Cebrián, G.; Junyent, M.; Mulà, I. Competencies in education for sustainable development: Emerging teaching and research developments. *Sustainability* **2020**, *12*, 579. [CrossRef]

14. Leal Filho, W. *Implementing Sustainability in the Curriculum of Universities*; Springer: Cham, Switzerland, 2017; pp. 1–13. [CrossRef]
15. Trejos, J.M.T.; Ayala Torres, J.S. Integración de las Funciones Sustantivas de la Educación Superior: Un Aporte para la Construcción de la Paz. Master's Thesis, Pontificia Universidad Javeriana, Cali, Colombia, 2018. Available online: <http://vitela.javerianacali.edu.co/handle/11522/11327> (accessed on 23 July 2020).
16. Fernández Verdecia, L.L.; Varela La, O.Y.; Sánchez Quesada, S.M.; Galiano Guerra, G.; Fernández Mesa, P.M. Modificación de conocimientos sobre educación ambiental en la carrera de Higiene y Epidemiología (Modification of knowledge about environmental education in the major Hygiene and Epidemiology). *Educ. Méd. Super.* **2016**, *30*, 304–310.
17. Fischer, D.; Jenssen, S.; Tappeser, V. Getting an empirical hold of the sustainable university: A comparative analysis of evaluation frameworks across 12 contemporary sustainability assessment tools. *Assess. Eval. High. Educ.* **2015**, *40*, 785–800. [CrossRef]
18. Lozano, R.; Merrill, M.Y.; Sammalisto, K.; Ceulemans, K.; Lozano, F.J. Connecting competences and pedagogical approaches for sustainable development in higher education: A literature review and framework proposal. *Sustainability* **2017**, *9*, 1889. [CrossRef]
19. Berdugo Silva, N.C.; Montaña Renuma, W.Y. La educación ambiental en las instituciones de educación superior públicas acreditadas en Colombia (Environmental Education in Accredited Public Institutions of Higher Education in Colombia). *Rev. Cient. Gen. José María Córdova*. **2017**, *15*, 127–136. [CrossRef]
20. Aleixo, A.M.; Leal, S.; Azeiteiro, U.M. Conceptualization of sustainable higher education institutions, roles, barriers, and challenges for sustainability: An exploratory study in Portugal. *J. Clean. Prod.* **2018**, *172*, 1664–1673. [CrossRef]
21. Ruiz-Mallén, I.; Heras, M. What sustainability? Higher education institutions' pathways to reach the Agenda 2030 goals. *Sustainability* **2020**, *12*, 1290. [CrossRef]
22. Biasutti, M.; Frate, S.A. Validity and reliability study of the attitudes toward sustainable development scale. *Environ. Educ. Res.* **2017**, *23*, 214–230. [CrossRef]
23. Esteban Ibáñez, M.; Amador Muñoz, L.V. Una aproximación a las actitudes de los universitarios hacia el Medio Ambiente. Una experiencia innovadora en el ámbito de las Ciencias Ambientales (An approach to the attitudes of university students towards the Environment. An innovative experience in the field of Environmental Sciences). *Rev. Estud. Exp. Educ.* **2018**, *17*, 81–100. [CrossRef]
24. Tapia-Fonllem, C.; Fraijo-Sing, B.; Corral-Verdugo, V.; Valdez, A.O. Education for sustainable development in higher education institutions: Its influence on the pro-sustainability orientation of Mexican students. *SAGE Open* **2017**, *7*. [CrossRef]
25. Cury, S.; Arias Astray, A.; Picornell Lucas, A.; Blanca Chana, F.; López Cózar, J. Análisis del impacto del programa de educación ambiental de Grefa en escolares y su entorno: Padres y profesores (Analysis of the impact of Grefa's environmental education program on schoolchildren and their environment: Parents and teachers). *Chron. Nat.* **2018**, *7*, 37–44.
26. García González, E.; Jiménez Fontana, R.; Azcárate, P. HAMS: Una herramienta para el análisis de la actividad metodológica del profesorado universitario desde los principios de sostenibilidad y complejidad (HAMS: A tool for the analyses of methodological activity of university professors from the principles of sustainability and complexity). *Rev. Espac.* **2018**, *39*, 28.
27. Junyent, M.; Bonil, J.; Calafell, G. Evaluar la ambientalización curricular de los estudios superiores: Un análisis de la Red EDUSOST (Evaluating the curriculum greening in higher education: An analysis of the edusost network). *Ensino Em Rev.* **2011**, *18*, 323–340.
28. Martínez Bernal, L.F.; Caro González, A.L.; Duran, J.C.D.; Pacheco Salazar, N.; Toro Calderón, J.J. Propuesta metodológica para la identificación y evaluación de aspectos ambientales en instituciones de educación superior (Methodological proposal for the identification and evaluation of environmental aspects in higher education institutions). *Gest. Ambient.* **2017**, *20*, 199–209. [CrossRef]
29. Muñoz Montilla, A.N.; Páramo Bernal, P. Monitoring environmental education processes: A proposal for structuring a system of environmental education indicators. *Rev. Colomb. Educ.* **2018**, *74*, 81–106.
30. Súcar Súcar, S.T.; Mota Palomino, N.Y. *Indicadores para Medir la Contribución de las Instituciones de Educación Superior a la Sustentabilidad (Indicators to Measure the Contribution of Higher Education Institutions to Sustainability)*, 1st ed.; Universidad de Guanajuato-Consortio Mexicano de Programas Ambientales Universitarios para el Desarrollo Sustentable (COMPLEXUS): Guanajuato, México, 2013; p. 197.
31. Escobar Pérez, J.; Cuervo Martínez, Á. Validez de contenido y juicio de expertos: Una aproximación a su utilización (Content validity and expert judgment: An approach to its use). *Av. En Medición* **2008**, *6*, 27–36. [CrossRef]
32. Esteban Ibáñez, M.; Lucena Cid, I.V.; Amador Muñoz, L.V.; Mateos Claros, F. Environmental Education, an Essential Instrument to Implement the Sustainable Development Goals in the University Context. *Sustainability* **2020**, *12*, 7883. [CrossRef]
33. Brill, J.M.; Bishop, M.J.; Walker, A.E. The competencies and characteristics required of an effective project manager: A web-based Delphi study. *Educ. Technol. Res. Dev.* **2006**, *54*, 115–140. [CrossRef]
34. Juárez Hernández, L.G.; Tobón, S. Análisis de los elementos implícitos en la validación de contenido de un instrumento de investigación (Analysis of the elements implicit in the validation of the content of a research instrument). *Rev. Espac.* **2018**, *39*, 23.
35. Ford, C. Effective practice instructional strategies: Design of an instrument to assess teachers' perception of implementation. *Stud. Educ. Eval.* **2018**, *56*, 154–163. [CrossRef]
36. Centro Universitario CIFE. *Instrumentos de Evaluación y Diagnóstico. Escala Jueces Expertos*; Centro Universitario CIFE: Cuernavaca, México, 2018; Available online: <https://cutt.ly/XnbOGCa> (accessed on 23 July 2019).
37. Penfield, R.D.; Giacobbi, P.R. Applying a score confidence interval to Aiken's item content-relevance index. *Meas. Phys. Educ. Exerc. Sci.* **2004**, *8*, 213–225. [CrossRef]

38. Bulger, S.M.; Housner, L.D. Modified Delphi investigation of exercise science in physical education Teacher Education. *J. Teach. Phys. Educ.* **2007**, *26*, 57–80. [CrossRef]
39. Centro Universitario CIFE. *Instrumentos de Evaluación y Diagnóstico. Cuestionario de Satisfacción con el Instrumento*; Centro Universitario CIFE: Cuernavaca, México, 2018. Available online: <https://cutt.ly/BnbOJPj> (accessed on 23 July 2019).
40. Cronbach, L.J. Coefficient alpha and the internal structure of tests. *Psychometrika* **1951**, *16*, 297–334. [CrossRef]
41. Sinakou, E.; Boeve de Pauw, J.; Van Petegem, P. Exploring the concept of sustainable development within education for sustainable development: Implications for ESD research and practice. *Environ. Dev. Sustain.* **2019**, *21*, 1–10. [CrossRef]
42. Cebrián, G.; Junyent, M. Competencies in education for sustainable development. *Sustainability* **2015**, *7*, 2768–2786. [CrossRef]
43. Simões Cacuaça, A.S.; López, G.Y.; Álvarez Díaz, M.B. Transversalidad de la Educación Ambiental para el Desarrollo Sostenible (Transversality of environmental education for sustainable development). *Rev. Univ. Soc.* **2019**, *11*, 25–32.
44. Brundiers, K.; Barth, M.; Cebrián, G.; Cohen, M.; Diaz, L.; Doucette-Remington, S.; Zint, M. Key competencies in sustainability in higher education—toward an agreed-upon reference framework. *Sustain. Sci.* **2021**, *16*, 13–29. [CrossRef]
45. Velásquez Sarria, J.A. La transversalidad como posibilidad curricular desde la educación ambiental (Transversality as a curricular possibility from environmental education). *Rev. Latinoam. Estud. Educ.* **2009**, *5*, 29–44.
46. Ezquerro Quintana, G.; Gil Mateos, J.E.; Rea Fajardo, S.; Torres Fuentes, P. Barreras en el proceso de ambientalización de la educación superior. El documento normativo como una alternativa para el cambio (Barriers to the process of environmentalization of higher education. The normative document as an alternative for change). *Rev. Espac.* **2019**, *40*, 1–9.
47. Ramos Mora, M.D.; Sánchez Contreras, M.F. La ambientalización curricular. Una mirada al proceso Ibero, Ciudad de México (Curricular greening. A look at the Ibero process, Mexico City). *Didac* **2018**, *71*, 35–49.
48. Shiel, C.; Smith, N.; Cantarello, E. Aligning campus strategy with the SDGs: An institutional case study. In *Universities as Living Labs for Sustainable Development*; Springer: Cham, Switzerland, 2020; pp. 11–27.
49. Alcón Latorre, M. La rúbrica como instrumento de evaluación en los estudios universitarios (Rubrics for assessment in higher education). *Observar* **2016**, *10*, 1–15.
50. Carvajal, A.; Centeno, C.; Watson, R.; Martínez, M.; Sanz Rubiales, Á. ¿Cómo validar un instrumento de medida de la salud? (How is an instrument for measuring health to be validated?). *An. Sist. Sanit. Navar.* **2011**, *34*, 63–72. [CrossRef] [PubMed]
51. Buela-Casal, G.; Sierra, J.C. *Manual de Evaluación Psicológica: Fundamentos, Técnicas y Aplicaciones (Psychological Assessment Manual: Fundamentals, Techniques and Applications)*; Siglo XXI de España Editores, S.A.: Madrid, España, 1997.
52. Hardesty, D.M.; Bearden, W.O. The use of expert judges in scale development: Implications for improving face validity of measures of unobservable constructs. *J. Bus. Res.* **2004**, *57*, 98–107. [CrossRef]
53. Connell, J.; Carlton, J.; Grundy, A.; Taylor Buck, E.; Keetharuth, A.D.; Ricketts, T.; Barkham, M.; Robotham, D.; Rose, D.; Brazier, J. The importance of content and face validity in instrument development: Lessons learnt from service users when developing the Recovering Quality of Life measure. *Qual. Life Res.* **2018**, *27*, 1893–1902. [CrossRef] [PubMed]
54. Haynes, S.N.; Richard, D.C.S.; Kubany, E.S. Content validity in psychological assessment: A functional approach to concepts and methods. *Psychol. Assess.* **1995**, *7*, 238–247. [CrossRef]
55. Polit, D.F. Assessing measurement in health: Beyond reliability and validity. *Int. J. Nurs. Stud.* **2015**, *52*, 1746–1753. [CrossRef]
56. Gliner, J.A.; Morgan, G.A.; Harmon, R.J. Measurement reliability. *J. Am. Acad. Child Adolesc. Psychiatry* **2001**, *40*, 486–488. [CrossRef]
57. Charter, R.A. A breakdown of reliability coefficients by test type and reliability method, and the clinical implications of low reliability. *J. Gen. Psychol.* **2003**, *130*, 290–304. [CrossRef]