UNIVERSITY SOCIAL RESPONSIBILITY AND ENVIRONMENTAL EDUCATION: CHALLENGES THAT CONTRIBUTE TO THE DEVELOPMENT OF EDUCATIONAL POLICIES IN CHILE

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SUMMARY

University social responsibility (USR), environmental education, and sustainability are linked and, at the same time, evidently promoted through policies that consider the goals of the Sustainable Development Goals (SDGs). This invites to modify institutional practices; likewise, it leads to the transformation of the behavior of all the actors that integrate the educational communities. The objective of this research is to explain the influence of students' perception of the social responsibilities of universities of Talca from the perspective of the SDGs through Empathy and Solidarity as an articulator of USR policies. A structural equation model is developed to explain the causal relationships according to the theoretical hypotheses. It can be pointed out that Empathy and Solidarity have a strong and positive influence on Respect and Dignity, while Respect and Dignity have a weak and positive influence on Freedom and Citizenship. Future research should consider the incorporation of contrast variables, in addition to the inferential exploration according to the sociodemographic characteristics of the participants. In this way, we contribute to the design of policies that promote training in the values that support USR and environmental education.

Introduction

University social responsibility (USR) is considered a field of study, a model, a tool, and an area of action, generating impacts from higher education institutions (HEIs), which are used to respond to the needs and demands of various stakeholders (Ali *et al*., 2021; Vallaeys *et al*., 2022). Moreover, the topicality of the subject is materialized in the constant concern of research developed in recent decades (Larrán and Andrades, 2017). In fact, there is a fundamental motive that determines the raison d'être of USR, sustained by the modification of people's behavior as members of an educational community and, as people who have individual and social responsibilities, from which environmental responsibilities emerge. In turn, these different responsibilities are evidenced by empathetic, supportive, and

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generous attitudes (Severino-González *et al*., 2021; Ennes *et al*., 2021). Therefore, the USR is a dynamic, complex, and integrator of consensual management that seeks to respond to society's challenges (Acuña-Moraga *et al*., 2023; Severino-González *et al*., 2023a).

USR, sustainability, and environmental education are linked as a product of the purpose that they pursue in society. Besides, these are concretized through the substantive functions of universities (Martí-Noguera and Gaete-Quezada, 2019). Also, they could incorporate the goals of the SDGs, which respond to the challenges of today's society. This society is characterized by being liquid, changing, demanding, competitive, and globalized (Araya-Castillo and Rivera-Arroyo, 2021; Coelho and Menezes, 2021; Koyuncuoglu, 2021). For this reason, it should be included, in a transversal way, the sensitization and awareness of the problems present in the communities.

Environmental education seeks to install ecological practices and lifestyles (Pirchio *et al*., 2021), which are in harmony with an environmental ethic (Rousell, 2020), based on values such as empathy and solidarity (Lochner, 2021). In this scenario, it is where HEIs, through their substantive functions, should seek an integral education where professional competencies and pro-environmental behaviors converge (Romero-Argueta *et al*., 2020; Mónus, 2021). Hence, the above-cited description is in harmony with the challenges set by the SDGs (Saari and Mullen, 2020), because of the ecological crisis that society is experiencing at various levels of personal and social life (Kaukko *et al*., 2021).

Literature review

The challenges of USR in Latin America are broad and diverse, according to Vallaeys *et al*. (2022) the discrepancies between universities, the need for social performance of society, and the incorporation of the SDGs in university decisions are found. In that respect, according to Urrunaga-Pastor *et al*. (2023), studies have been developed that contextualize and raise the particular requirements of each country that makes up the Latin American region (Arbieto-Mamani *et al*., 2023). In this case and in regard to this research, in Chile, the RSU is linked to education based on comprehensive training that constitutes attitudes and decisions in students for the generation of collective benefits in the territories (Severino-González *et al*., 2023b). All of these constitute strategies, models, and policies that seek to contribute to the training of comprehensive professionals (Bahamondes-Masafierro, 2022).

The USR policies and strategies must be able to contribute to the comprehensive training of future professionals (Romero-Argueta *et al*., 2020), for which it is necessary to consider the missionary duty of higher education institutions and their substantive functions (Vallaeys and Álvarez, 2019). Furthermore, the above-mentioned arguments include elements, such as education in values and environmental education, and student-centered education (Sarmiento-Peralta *et al*., 2021; Gómez-Olmedo *et al*., 2020), which contribute to the generation of virtuous circles. Henceforth, this occurs owing to the implementation of strategies emanating from testimonial education (Severino-González *et al*., 2019a).

The third mission of universities has subsumed a primary relationship with the community and, therefore, with each of the actors that develop in the environment. The aforementioned point constitutes what is called territorial social responsibility (TSR). This must be materialized through the SDGs for which environmental education is important (Nardo *et al*., 2021; Jelinkova *et al*., 2021; Reid *et al*., 2021). The above said terms, require cooperative work since SLR is a public good and a human right inherent to each person (Gaete-Quezada, 2021). Thus, these protagonists are the state guarantors and higher education institutions, which should lead to valorization, learning, and social transformation (Grimaldo, 2017; Escobar *et al*., 2021).

Consequently, it is necessary that HEIs consider the substantive functions of the USR for the discovery of social responsibilities (Vallaeys *et al*., 2022), which must be located in the territories and coherent with the requirements of the communities. For this reason, it is necessary to insert values into students, such as solidarity, empathy, commitment, justice, and respect (Bosio and Schattle, 2021; Severino-González *et al*., 2022a). In addition, this requires teaching and learning for and with students (Sarmiento-Peralta *et al*., 2021), responding to an integral education, based on other values about patience, support, and self-control (Martí-Noguera *et al*., 2018; Lochner, 2021).

Regarding all that is described above, the hypotheses of this study are presented: Hypothesis 1: The perception of the social responsibilities of universities from the perspective of Empathy and Solidarity positively influences the perception on policies associated with Respect and Dignity. Hypothesis 2: The perception of the social responsibilities of universities from the perspective of Empathy and Solidarity positively influences the perception on the policies associated with the Environment and environment. Hypothesis 3: The perception of the social responsibilities of universities from the perspective of Empathy and Solidarity positively influences the perception on policies associated with Freedom and Citizenship. Hypothesis 4: the perception of the social responsibilities of universities from the perspective of Respect and dignity positively influences the perception on policies associated with Freedom and citizenship. In accordance with our previous argument, we present the following conceptual model (Figure 1).

Methodology

The following section presents the characteristics of the

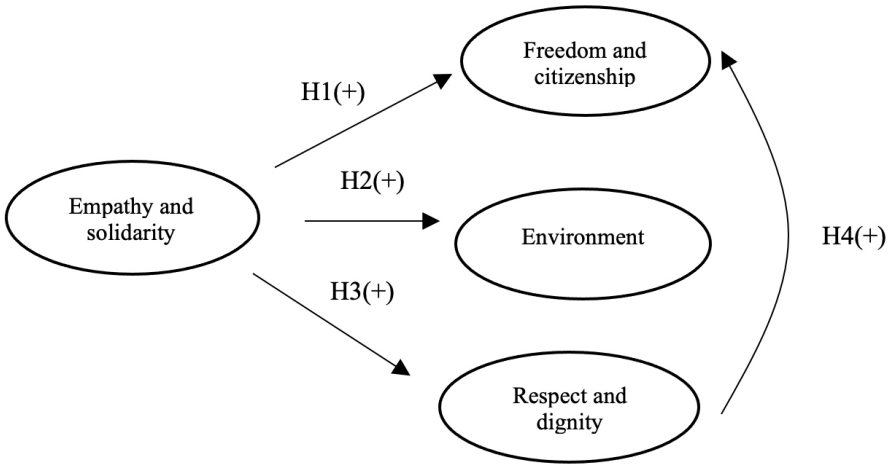

Figure 1. Conceptual model and hypothesis.

structural equation models. Then, the characteristics of the population and sample are detailed. Subsequently, the instrument used to obtain the information is presented. Finally, the procedure and strategies in relation to the measurement model and the structural model are explained.

Structural equation models

In the present work, the strategies of the structural equation models based on partial least squares are applied, which will allow the analysis of the causality hypotheses through multivariate analysis techniques, facilitating the simultaneous verification according to the hypotheses proposed in the research because uses fundamental relationships between matrices (Hair *et al*., 2011). In this research, the Smart PLS v.3.2.8 software (Ringle *et al*., 2014) was used. With this technique, second-generation constructs are designed, and measured through observed variables (Fornell, 1982; Hair *et al*., 2011).

Characteristics of the population and the sample

The population is made up of 40,132 university students from IES located in the city of Talca, Chile. The non-probabilistic sample is composed of 230 subjects (Table I), of which 47.0% are women and 53.0% are men. Regarding the number of family group members, the highest number is made up of students who reported having 4 to 6 members, a total of 27.8%. Regarding the area of origin, the highest number is concentrated in the group of women who come from urban areas, 37.4%. In relation to dedication, the highest concentration is made up of men and women who only dedicate themselves to studying. Finally, pertaining to the year of entry, the highest concentration of students is composed of women who entered in 2018.

Measuring instrument

The measurement instrument used in this research has been structured in three parts. Initially, the first section considers the application of filter questions, which ensure the characteristics that the research subjects must possess. These people must be students who belong to HIEs since only university students, from the city of Talca, Chile, are considered in this research. Then the second section gathers information that allows us to know the socio-demographic characteristics of each of the university students, such as number of members of the family group, area of origin, dedication, and year of entrance to the university. Eventually, the third section presents the Likert-type scale on the perception of social responsibility of HEIs from the perspective of the SDGs.

The social responsibility scale used in this research is a proposal that includes the findings of Delpiano and Ardiles (2003), Touriñán (2008), Navarro (2006), Navarro *et al*. (2012), and Severino-González *et al*. (2018). This was validated by Severino-González *et al*. (2022a), yielding reliability and consistency indicators considered satisfactory and sufficient to be used in subsequent research. Subsequently, it has been applied more recently in the study of Severino-González *et al*. (2022a), allowing the testing of several hypotheses in a study carried out in Colombia.

TABLE I
CHARACTERISTICS OF THE STUDENTS (%)

Characteristics	Criteria	Male	Female
No. of family members	1 a 3	17.4	26.1
	4 a 6	27.8	26.1
	7 or more	1.7	0.9
Territory	Urban	34.3	37.4
	Rural	12.6	15.7
Occupation	Study only	40.4	38.7
	Study and work	6.5	14.3
Year of university entrance	2013	0.4	0.0
	2014	2.2	2.6
	2015	13.0	8.7
	2016	7.8	7.0
	2017	3.0	5.2
	2018	13.5	20.9
	2019	7.0	8.7

This research is developed in two steps: first, an analysis of the measurement model is applied and, second, the structural model is analyzed to test the hypotheses. The dimensions of the scale are as follows: (i) Freedom and Citizenship, (ii) Environment, (iii) Respect and Dignity, and (iv) Empathy and Solidarity (Table II). As for the response alternatives, a Likert-type scale with five levels is available: 1: Totally disagree, 2: Disagree, 3: Neither agree, 4.: Agree and 5: Totally agree.

Procedure and analysis strategy

The collection of information for this research was carried out online through a link between the months of October, November, and December 2019 until January 2020. The university students of the HEIs gave their answers to the instrument voluntarily, anonymously, and confidentially. In addition, it was noted that participation was free of economic retribution and other rewards. Once the data were collected, they were exported to a database created with Microsoft Excel, and then sorted and systematized so that they could be used in the Smart PLS v.4.0 software (Ringle *et al*., 2014).

Once arranged, a confirmatory factor analysis (CFA) is applied. It was considered the criteria established by Henseler *et al*. (2016), in terms of Cronbach's alpha and composite reliability indicators. In the same way, it is considered for the discriminant validity analysis what was proposed by Fornell and Larcker (1981) and what was suggested according to the heterotrait-monotrait criterion -HTMT- of Henseler *et al*. (2015). Subsequently, the structural model is analyzed. This model allows confirming or refuting the theoretical hypotheses using empirical data employing the findings after the search for causalities between latent variables.

Regarding the structural model, Chin (2010) proposal is considered for the development of the R^2 analysis of the variances of the latent dependent variables. Thereafter, the points of Falk and Miller (1992) are considered for the approach of the path coefficients (β). Finally, the proposal of Hair *et al*. (2013) is kept in mind for the examination of the Q^2 and f^2 values for the approach of the theoretical hypotheses according to the objective of this research.

Results

This section presents the main findings of the confirmatory factor

TABLE II
SCALE OF PERCEPTION OF SOCIAL RESPONSIBILITY OF HEIS BASED ON THE SDGS

Dimensions	Variables	Affirmations
Freedom and Citizenship	C1	Mechanisms are in place to raise the opinions and concerns of the members of the institution.
	C2	Your opinion is considered in the definition of tasks and responsibilities.
	C3	It contributes to the formation of a solid opinion on issues affecting the community.
	C5	Respect for the rights and duties of the members of the institution is encouraged.
	F1	The members of the institution are involved in various social activities.
	F3	The ideas and initiatives of the people who are part of the institution are welcomed.
	F4	Spaces for conversation about problems that affect society, and the environment are promoted.
Environment	E2	Care for the environment is included in the curriculum.
	E3	The correct use of water, energy, and gas is encouraged.
	E4	Containers are available to separate garbage according to the type of material (glass, paper, plastic, organic waste, among others).
Respect and Dignity	D1	There is an atmosphere of respect among the members of the institution.
	D3	Personal and emotional support is provided to members who have difficulties.
	D4	Respect for people who are not part of the institution is encouraged.
	D5	Resources are invested for the development of activities under minimum hygiene and safety conditions.
Empathy and Solidarity	E1	There is education in the prevention of diseases that affect the integrity of their members.
	S1	Support is encouraged for low-income communities, as well as excluded, vulnerable, and/or minority groups.
	S3	Respectful treatment of all people without exception (ethnicity, disability, gender, sexual orientation, among others) is promoted.
	S4	Activities that integrate all members of the institution are carried out.

analysis (CFA) and the assessment of the structural model that allow us to evaluate the hypotheses put forward in this research, whose main objective is to explain the relationships between the latent variables that constitute the perception of university students on the social responsibility of HEIs.

Analysis of the measurement model

In Table III, the reliability of the scale can be observed, for which the individual reliability of each variable (λ) was calculated, as well as Cronbach's Alpha (α), rho A, composite reliability (CF), and average variance extracted (AVE). In regard to the individual loadings, according to Hair *et al*. (2014), the values of each loading (λ) should be considered acceptable if they are greater than 0.7; all met that test apart from the variables S2, E1, D2, D5, C2, C4, F1, and F4 that were eliminated, retaining 13 of 18 initial variables. As for the reliability of

TABLE III
CONFIRMATORY FACTOR ANALYSIS, RELIABILITY ANALYSIS, AND CONVERGENT VALIDITY

Dimensions	Variables	Loadings (λ)	Cronbach's Alpha (α)	rho_A	Composite Reliability (CR)	Average Variance Extracted (AVE)
Empathy and Solidarity	S1	0.854	0.793	0.839	0.873	0.696
	S3	0.856				
	S4	0.791				
Respect and Dignity	D1	0.804	0.739	0.810	0.846	0.647
	D3	0.878				
	D4	0.724				
Freedom and Citizenship	C1	0.806	0.804	0.865	0.863	0.614
	C3	0.738				
	C5	0.871				
	F3	0.708				
Environment	E2	0.797	0.833	1.213	0.886	0.723
	E3	0.803				
	E5	0.943				

the scale, Cronbach's alpha (α) and composite reliability (CR) were estimated. Regarding Cronbach's Alpha (α), the minimum acceptable value is 0.7 (Cronbach and Shavelson, 2004), noting that all meet that criterion, the minimum value being 0.793; as for the CR, the minimum recommended value is 0.8 (Vandenberg and Lance, 2000; Henseler *et al*., 2016), the minimum value being 0.846. All of which allows us to ensure that there is internal consistency in each of the constructs.

Regarding the conceptualization of the dimensions. Empathy and Solidarity consider a set of actions that seek to help people with limited resources, as well as groups that are excluded and vulnerable and/or minorities through strategies that contribute to the integrity of human beings in society. Meanwhile, Respect and Dignity are associated with actions that seek respect for the people who integrate the institution; in addition, this relation provides personal and emotional support, which includes resources that ensure minimum conditions of hygiene and safety. On the other hand, Freedom and Citizenship are constituted by actions that stimulate coexistence and the determination of tasks; these facts promote community participation and the development of public opinion, which involves initiatives that address societal problems. Finally, regarding Environment, this refers to actions that seek to promote environmental care and the responsible use of resources, as well as the separation of disused materials.

Next, the convergent and discriminant validity of the model is tested, which allows us to assess the degree to which the variables admit the development of measurements that can lead to the same results (Fornell and Larcker, 1981). In addition, it reveals the existence of differences between each dimension and its variables with reference to the other dimensions and variables (Hair *et al*., 2011). With respect to convergent validity, the average variance extracted (AVE) of each dimension is analyzed considering the proposal of Fornell and Larcker (1981). It can be observed in Table III that the values are between 0.574 and 0.764, being all considered satisfactory for being higher than 0.5 (Hair *et al*., 2011). Therefore, after analyzing the values, it can be said that the model has convergent validity.

Now, concerning discriminant validity, the criteria of Fornell and Larcker (1981) and Roldán and Sánchez-Franco (2012) are applied. On the one hand, the results of the square root of AVE are considered and, on the other hand, the values are calculated as a function of the heterotrait-monotrait relationship (HTMT). Regarding the criterion proposed by Fornell and Larcker (1981), it can be noted that the square root of AVE located on the diagonal of Table IV are above the correlations between constructs (0.834 >0.694, 0.477, and 0.522; 0.783 >0.694, 0.451, and 0.563; 0.850 >0.477, 0.451, and 0.392; and 0.805 >0.522, 0.563, and 0.392), which allows us to ensure that this criterion is met (Henseler et at., 2015).

On the other hand, regarding with the criterion proposed by Henseler *et al*. (2015), the heterotrait-monotrait ratio (HTMT) establishes that the highest threshold should not exceed 0.90. In view of this, it can be observed in Table V that all are lower than that value, granting discriminant validity to the model.

Pertaining to the values found, it can be indicated that there is sufficient convergent and discriminant validity to be able to develop structural models for contracting theoretical hypotheses through empirical data. This allows for an explanation of the causality situations between the constructs that integrate the social responsibility of HEIs from the SDGs in Chile.

Analysis of the structural model

The assessment of a structural model allows us to explain the relationships between latent variables. In this research, hypotheses are proposed considering the students' perception of the social responsibilities of HEIs from the perspective of the SDGs through Empathy and Solidarity concerning the dimensions of Respect and Dignity, Environment and Freedom, and Citizenship. Similarly, these variables address the associations between Respect and Dignity with Empathy and Solidarity, Environment, and Freedom and Citizenship.

The values associated with the significance of the proposed causal relationships are analyzed through the path (β), considering indicators such as standard deviations (SD), t-statistics (Bootstrap), correlation, and p-value. Afterwards, the percentile, confidence intervals (CI) and bias-corrected CI were determined, all of which allow determining the capacity of the structural model to explain the relationships between latent variables. Subsequently, statistics were developed to determine the predictive power of the structural model through the values obtained for each dependent construct. For this purpose, the strength of the structural path is observed thanks to the R^2 of the variances of the latent dependent variables and at the same time the Q^2, f^2, SRMR, d-ULS, and d-G (Falk and Miller, 1992).

Table VI shows the path coefficients (β), standard deviation (SD), t-statistics, correlations, and p-value of each latent construct. Besides, the path coefficients (β) allow us to analyze the relative strength of the statistical relationships between each construct, which should be greater than 0.3 (Chin, 1998). All of which allows us to point out the following: regarding H1 that the

TABLE IV
DISCRIMINANT VALIDITY ACCORDING TO THE CRITERIA OF FORNELL AND LARCKER (1981)

Dimensions	Empathy and Solidarity	Freedom	Environment	Respect and Dignity
Empathy and Solidarity	0.834			
Freedom and Citizenship	0.694	0.783		
Environment	0.477	0.451	0.850	
Respect and Dignity	0.522	0.563	0.392	0.805

TABLE V
DISCRIMINANT VALIDITY TO THE MODEL

Dimensions	Empathy and Solidarity	Environment	Freedom and Citizenship	Respect and Dignity
Empathy and Solidarity				
Environment	0.666			
Freedom and Citizenship	0.676	0.539		
Respect and Dignity	0.617	0.505	0.684	

TABLE VI
SIGNIFICANT RESULTS OF THE STRUCTURAL MODEL

Hypotheses	Path coefficients (β)	Standard Deviation (SD)	Statistics (Bootstrap)	Correlation	P Values	Support (Yes /No)
H1. Empathy and Solidarity → Freedom and Citizenship	0.550	0.061	9.004	0.574	0.000	Yes
H2. Empathy and Solidarity → Environment	0.477	0.053	9.062	0.528	0.000	Yes
H3. Empathy and Solidarity → Respect and Dignity	0.522	0.049	10.704	0.486	0.000	Yes
H4. Respect and Dignity → Freedom and Citizenship	0.276	0.065	4.267	0.558	0.000	Yes

perception of Empathy and Solidarity positively influences the perception of Freedom and Citizenship (β= 0.550; SD= 0.061; t= 9.004; p-value= 0.000). Otherwise, as regards H2, it can be indicated that the perception of Empathy and Solidarity positively influences the perception of Environment (β= 0.477; SD= 0.053; t= 9.062; p-value= 0.000). Now, when considering H3, it can be noted that the perception of Empathy and Solidarity positively influences the perception of Respect and Dignity (β= 0.522; SD= 0.049; t= 10.704; p-value= 0.000). Finally, it can be noted that the perception of Respect and Dignity positively influences the perception of Freedom and Citizenship (β= 0.276; SD= 0.065; t= 4.267; p-value= 0.000).

Regarding the estimation of the theoretical hypothesis, the bootstrapping technique is developed through a nonparametric resampling. This provides the standard error, as well as the values of the student's t statistic for the parameters. Moreover, a bootstrapping test of 5000 subsamples is considered and a T-Test (Student's T-Test) distribution was used, with one tail and n - 1 degrees of freedom where n is the number of subsamples. In this respect, in Table VII, the paths proposed in the model are observed which present different levels of significance. These levels allow affirming that the four hypotheses of the model are supported by the findings of this research. These also confirm the contribution that the policies and strategies developed by the universities associated with Empathy and solidarity have in the construction of the perception of the SR of the university student from the SDGs. In that regard, for the calculation of the confidence intervals (CI) and bias-corrected CI, the bootstrapping procedure is used, resulting in all values greater than zero, being satisfactory according to Chin (1998).

Regarding the quality of the structural model, a Bootstrapping (sample of 5000) and Blindfolding analysis is applied to assess the quality of the structural model, considering a Student's T distribution with n -1 degrees of freedom, where n is the number of subsamples (Hair *et al*. 2011). Then this makes it possible to determine the predictive relevance and the total effects of each independent variable on a variable through the Q^2 and f^2 values (Table VII). It should be noted that model goodness-of-fit indicators have been analyzed to determine the strength of each path (Falk and Miller, 1992; Henseler *et al*., 2016) since the Q^2 and f^2 values contribute to the determination of the predictive relevance and total effect of each independent variable on a variable in terms of the proposed structural model.

Table VIII shows Q^2, f^2, R2, SRMR, d-ULS and d-G. Relating to the values of Q^2, it can be noted that the predictive relevances of H1, H2, and H3 are average and positive, because values greater than 0.25, viz: H1= 0.394, H2= 0.373, H3= 0.447 and H4= 0.312 (Hair *et al*., 2013). Now, as for f^2, it can be indicated that as for H1 and H3 present large effects since they are greater than 0.35, in relation to H2, the effect is moderate since its value is between 0.15 and 0.35 and, as for H4 it has small effect since its value is between 0.02 and 0.15 (Hair *et al*., 2019). Finally, it should be noted that according to SRMR, d-ULS, and d-G which allow analyzing the overall fit of the model, the indicators confirm that the model fits the data well and is aligned with the theory that supports it.

Discussion

The purpose of this research is to explain the influence of students' perception of the social responsibilities of universities of Talca from the perspective of the SDGs through Empathy and Solidarity as an articulator of USR policies. This way, the findings of this

TABLE VII
PATH COEFFICIENT (B), PERCENTILE CI, AND BIAS-CORRECTED CI

Hypotheses	Path coefficient (β)	CI – percentile 5.0%	CI – percentile 95.0%	Corrected CI bias - 5.0%	Corrected CI bias - 95.0%
H1. Empathy and Solidarity → Freedom and Citizenship	0.550	0.289	0.508	0.289	0.507
H2. Empathy and Solidarity → Environment	0.477	0.455	0.612	0.433	0.594
H3. Empathy and Solidarity → Respect and Dignity	0.522	0.391	0.586	0.368	0.570
H4. Respect and Dignity → Freedom and Citizenship	0.276	0.257	0.484	0.243	0.470

TABLE VIII
PREDICTIONS AND EFFECTS OF THE HYPOTHESES

Hypotheses	Q^2	f^2	R^2	SRMR	d-ULS	d-G
H1. Empathy and Solidarity → Freedom and Citizenship	0.394	0.476	0.397	0.071	0.752	0.279
H2. Empathy and Solidarity → Environment	0.373	0.294	0.528			
H3. Empathy and Solidarity → Respect and Dignity	0.447	0.375	0.486			
H4. Respect and Dignity → Freedom and Citizenship	0.312	0.120	0.364			

research contribute to the design of plans and programs that respond to the challenges that underlie the various challenges imposed by environmental and social changes that affect the entire social fabric through socially responsible actions. Besides, all these efforts respond to the demands of a changing, dynamic, volatile, and uncertain society.

The challenges facing today's society include the effects caused by social, educational, economic and, above all, environmental problems. It is in this scenario, where HEIs, through their policies and strategies linked to USR and environmental education, must establish a culture based on ecological and socially sustainable practices (Mónus, 2021; Escobar *et al*., 2021). Thereupon, this highlights the importance of this research due to the causality effects between the latent variables that constitute the perception of university students on the social responsibility of HEIs. Finally, this contributes to sustainable and socially responsible behaviors.

The results show that the constructs that make up the concept of university social responsibility based on the SDGs can be used as an articulator of university social responsibility (RSU) and environmental education policies: Freedom and Citizenship, and Environment, Respect and Dignity, and Empathy and Solidarity. In effect, this creates several challenges that HEIs must recognize and, at the same time, assume through institutional policies and strategies for the training of professionals characterized by their pro-environmental behaviors (Bertossi and Marangon, 2022). Additionally, these constructs, which can be considered as guidelines and orienting guides, can be associated with the substantive functions of the HEIs themselves. Similarly, this is in line with the findings of Severino-González *et al*. (2022a), which may motivate the design of supranational or, at least, Latin American strategies where social responsibility, sustainability, SDGs, and environmental education converge.

The findings show the relationship between the actions connected to empathy and solidarity developed by HEIs in correspondence with the efforts for the promotion of Freedom and Citizenship, in addition to Respect and Dignity (Ünal and Kaygın, 2020; Wiryomartono, 2022). In addition, this finding always considers the interests and requirements emanating from the Environment (Coelho and Menezes, 2020; Ali *et al*., 2021). Consequently, this contributes to the creation of value for each stakeholder group.

It should be added that the effects, referring to the perception of actions associated with Respect and Dignity in accordance with the perception of activities with regard to Freedom and Citizenship, are small. In fact, this could be due to the development of actions that meet the challenges that HEIs must assume. The above-mentioned should be included in the institutional orientations regarding USR and environmental education.

Consequently, the urgency of USR and environmental education in correspondence with the SDGs is evident (Lucas-Mangas *et al*., 2021; Alm *et al*., 2022). Indeed, this is due to the social and environmental crisis that society is suffering. The aforementioned situation is the result of the havoc caused by people themselves because of lifestyles characterized by consumerism, and lack of social and environmental awareness (Pirchio *et al*., 2021). It is in this context, where HEIs must install through their institutional policies and strategies a culture based on ethics and environmental care (Wided, 2020; Moghadam *et al*., 2021). After all, it is necessary the development of empathy and solidarity as a value that is present in each of the decisions made by a person in society (Martí-Noguera *et al*., 2018; Lochner, 2021).

Conclusions

The study of USR has been approached from various theoretical approaches (Larrán-Jorge and Andrades-Peña, 2015; Duque and Cervantes-Cervantes, 2019). On the other hand, the approach to environmental education has provided spaces for its research due to the various factors that influence pro-environmental behaviors (Varela-Candamio *et al*., 2018). Henceforth, all of the above approaches contribute to the education of the future given how urgent it is for the present (Suárez-Perales *et al*., 2021). It is in this space, where the challenges of the institutional guidelines for the installation of actions characterized by empathy and solidarity as a response to the challenges of the SDGs arise.

The findings of this study provide inputs for the design of policies, models, strategies, guidelines, plans, and programs that respond to the needs of the stakeholders. Henceforth, this is due to the efforts associated with the third mission, responding to the territorial social responsibilities that HEIs have with each of the stakeholders (Voegtlin and Scherer, 2017).

The articles that use quantitative scales for the treatment of data that allow the analysis of behaviors, attitudes, perceptions, and preferences, always have limitations that make it possible to develop new research or to refute the findings through future research. Regarding the limitations, the sample could be larger. Moreover, probabilistic techniques could be considered for the application of the instrument. In addition, the application of statistically significant differences could be used for comparison between subgroups. Also, the questionnaires could be applied to different groups of stakeholders in the educational

community, and, at the same time, in-depth interviews could be conducted with key stakeholders.

It is necessary that future research can use probabilistic techniques for the constitution of the research sample to achieve representativeness of the population. Thus, this allows reliable comparison with the results of research with similar characteristics. Besides, it is recommended to apply the questionnaire after some educational and institutional intervention *related to USR and environmental education. Therefore, this has to be done to detect the* effects caused in university students. Likewise, it is urgent to consider some external actors to contrast the findings and the adequate understanding of the object of study. Finally, it is important to apply new inquiries where it is possible to associate USR, SDGs, and environmental education, which could reveal pro-environmental behaviors. At the same time, it is pertinent to do more research studies that provide tools to design policies and strategies that influence the preferences and decisions of university students.

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RESPONSABILIDAD SOCIAL UNIVERSITARIA Y EDUCACIÓN AMBIENTAL: DESAFÍOS QUE CONTRIBUYEN AL DESARROLLO DE POLÍTICAS EDUCATIVAS EN CHILE

Pedro Severino-González, Dolores Gallardo-Vázquez, Hugo Lira-Ramos, Giusseppe Sarmiento-Peralta, José de Jesús Romero-Argueta y Constanza Ortuya-Poblete

RESUMEN

La responsabilidad social universitaria (RSU), la educación ambiental y la sostenibilidad están vinculadas y, al mismo tiempo, evidentemente impulsadas a través de políticas que consideren las metas de los Objetivos de Desarrollo Sostenible (ODS). Esto invita a modificar las prácticas institucionales y, asimismo, a transformar el comportamiento de todos los actores que integran las comunidades educativas. El objetivo de esta investigación es explicar la influencia de la percepción de los estudiantes sobre las responsabilidades sociales de las universidades de Talca desde la perspectiva de los ODS a través de la Empatía y la Solidaridad como articulador de políticas de RSU. Se desarrolla un modelo de ecuaciones estructurales para explicar las relaciones causales según las hipótesis teóricas. Se puede señalar que la Empatía y la Solidaridad tienen una influencia fuerte y positiva sobre el Respeto y la Dignidad, mientras que el Respeto y la Dignidad tienen una influencia débil y positiva sobre la Libertad y la Ciudadanía. Futuras investigaciones deberían considerar la incorporación de variables de contraste, además de la exploración inferencial según las características sociodemográficas de los participantes. De esta manera, contribuimos al diseño de políticas que promuevan la formación en los valores que sustentan la RSU y la educación ambiental.

RESPONSABILIDADE SOCIAL UNIVERSITÁRIA E EDUCAÇÃO AMBIENTAL: DESAFIOS QUE CONTRIBUEM PARA O DESENVOLVIMENTO DE POLÍTICAS EDUCACIONAIS NO CHILE

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RESUMO

A responsabilidade social universitária (RSU), a educação ambiental e a sustentabilidade estão vinculadas e, ao mesmo tempo, evidentemente promovidas por meio de políticas que consideram as metas dos Objetivos de Desenvolvimento Sustentável (ODS). Isto convida a modificar as práticas institucionais e, da mesma forma, a transformar o comportamento de todos os atores que integram as comunidades educativas. O objetivo desta pesquisa é explicar a influência da percepção dos estudantes sobre as responsabilidades sociais das universidades de Talca na perspectiva dos ODS através da Empatia e da Solidariedade como articuladores das políticas de RSU. Um modelo de equações estruturais é desenvolvido para explicar as relações causais de acordo com as hipóteses teóricas. Pode-se apontar que a Empatia e a Solidariedade têm uma influência forte e positiva no Respeito e na Dignidade, enquanto o Respeito e a Dignidade têm uma influência fraca e positiva na Liberdade e na Cidadania. Pesquisas futuras deverão considerar a incorporação de variáveis de contraste, além da exploração inferencial de acordo com as características sociodemográficas dos participantes. Desta forma, contribuímos para a concepção de políticas que promovam a formação nos valores que sustentam a RSU e a educação ambiental.