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# CREATIVE THINKING AND SUSTAINABLE DEVELOPMENT: DESIGN AND VALIDATION OF A SCALE FOR UNIVERSITY STUDENTS

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## SUMMARY

*Creative thinking is recognized as essential for enhancing personal and social well-being and for addressing contemporary challenges. Developing creative thinking skills contributes to the achievements of the Sustainable Development Goals (SDGs). Thus, integrating creative thinking with the SDGs provides individuals with tools necessary to implement sustainable practices. The ob-*

*jective of this research was to design and validate a scale for assessing creative thinking skills from the perspective of sustainable development in university students. The main contribution is its emphasis on the development of creative thinking skills from an SDG perspective. The findings suggest that fostering these skills can drive innovations that benefit society in times of uncertainty.*

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## Introduction

 Universities are institutions dedicated to the generation and transmission of knowledge to educate well-rounded professionals who are competent, creative,

committed, and socially responsible. This aligns with one of the core functions of higher education institutions (HEIs), particularly in light of pressing environmental and social challenges such as climate change, biodiversity loss, and increasing social inequalities (Acosta and Queiruga-Dios, 2022). Accordingly, universities are

expected to foster values of social responsibility and sustainability while promoting critical, complex, and creative thinking (Mao *et al.*, 2022; Severino-González *et al.*, 2023).

Such an approach enables a comprehensive and cross-cutting response to socio-environmental issues.

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**KEYWORDS / Creative Thinking / Higher Education / Skills Assessment / Sustainable Development Goals / University Students /**

Received: 05/24/2025. Modified: 07/26/2025. Accepted: 07/29/2025.

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However, there remains a need for scales that empirically and theoretically demonstrate the relationship between creative thinking and sustainable development (Schulz *et al.*, 2021). This study focuses specifically on creative thinking skills for sustainable development, due to its non-linear, divergent, and integrative nature (Arshinov and Budanov, 2022).

Creative thinking has the potential to reconfigure mental structures and transform core community dynamics (Dilekçi and Karatay, 2023; Maiden *et al.*, 2023). HEIs should therefore re-evaluate their educational models and institutional frameworks to integrate strategies that engage students early on with social and environmental challenges (Taillandier, 2021).

Higher education currently faces increasingly complex, uncertain, diverse, and rapidly changing scenarios, which highlights the need for a new logic to understand and address social realities effectively (Alenezi, 2023). Such new logics reshape interpersonal relationships among university students and influence their connection to the environment and their understanding of life experiences (De Clercq *et al.*, 2024).

Thinking styles have been widely studied using various methodologies. Nonetheless, the vast diversity of thinking styles leaves a gap in the study of complex, holistic, contemplative, and creative modes of thought. According to Lebuda and Benedek (2023), these styles often overlook elements such as human well-being, social harmony, and educational ethics (Table I).

The relevance of creative thinking has been confirmed in studies linking it to the full development of human potential (Chen *et al.*, 2022). Research in this field has led to the development of conceptual models aimed at cultivating creative thinking (Saleh and Brem, 2023). However, these models often reflect a reductionist view of human creative capacity (Abdildina and Abdildin, 2018).

In university students, creative thinking and sustainable development are intrinsically connected. Creative thinking promotes the generation of innovative and disruptive solutions to environmental, economic, and social challenges (Seibert, 2021). It also enhances students' ability to promote sustainable practices by identifying opportunities and proposing solutions that benefit both society and the environment (Manna *et al.*, 2022).

Creative thinking plays a critical role in designing socially responsible strategies aligned with the Sustainable Development Goals (SDGs) (Koçulu and Topçu, 2024). In this context, universities must foster university social responsibility (USR) through their core functions (Finatto *et al.*, 2024). This reinforces the relationship between the SDGs and USR by promoting education that builds skills grounded in empathy, solidarity, justice, dignity, and respect (Gallardo-Vázquez *et al.*, 2024; Liu *et al.*, 2025). All of this contributes to the social well-being of educational communities (Coelho and Menezes, 2022).

Students with creative abilities can become agents of change by promoting sustainability through innovation. Creative thinking facilitates interdisciplinary collaboration (Craven and Frick, 2024), which is essential for addressing the complexity of sustainability-related challenges (Ramírez Molina *et al.*, 2022). In this regard, students who think creatively are able to connect ideas, methods, and practices across disciplines, fostering comprehensive, effective, and sustainable solutions (Li *et al.*, 2022). In conclusion, creative thinking and sustainable development are complementary elements that should be included in the formative processes, due to the contributions they generate to the welfare of society in general.

### Research Methods

This study is a non-experimental, cross-sectional, observational, and instrumental investigation, as it aims to validate a quantitative scale. The instrument was applied between September and October 2023.

#### Participants

A non-probabilistic convenience sample was used, comprising 464 university students from higher education institutions in central and southern Peru. The participants were distributed as follows: 53.4% were women and 46.6% were men. Regarding year of study, 20.9% were first-year students, 22.4%

TABLE I  
SOME REFERENCE STUDIES

Thinking	Studies
Open	Lewis (1986); Jung and Lee (2022)
Active	Baron (1993); Stanovich and West (2008)
Analytical	Sloman (1996); Kozhevnikov (2007); Šrol (2022)
Causal	Stuart-Fox (2014); Lombard and Gardenfors (2017); Gardenfors and Lombard (2020)
Complex	Nicolescu (2010); Maldonado and Gómez (2014); Morin (2017)
Convergent	Chen <i>et al.</i> (2021); de Vink <i>et al.</i> (2022)
Contemplative/Meditative	Heidegger (2002); Abdullah (2022); Komjathy (2022)
Creative	Thagard and Steward (2011); Chen <i>et al.</i> (2019)
Critical	Halpern (1998); Seibert (2021); Mao <i>et al.</i> (2022).
Divergent	Chen <i>et al.</i> (2021); de Vink <i>et al.</i> (2022)
Spiritual	Zohar (2000); Skrzypińska (2021); Ma and Wang (2022)
Holistic	Choi <i>et al.</i> (2007); Hong <i>et al.</i> (2021); Chen <i>et al.</i> (2022)
Intuitive	Lee (2005); Park and Song (2020); Alaybek <i>et al.</i> (2022)
Magical	Suddaby <i>et al.</i> (2017); Ganzin <i>et al.</i> (2020); Nelson <i>et al.</i> (2020)
Symbolical	Romero <i>et al.</i> (2012); Di Ceglie (2017); Miyagawa <i>et al.</i> (2018)

Source: Author’s own elaboration.

second-year, 23.5% third-year, 19.2% fourth-year, and 14.0% fifth-year students.

Analysis procedures and strategies

The study was organized into three phases to support the design and validation of measurement instruments (Muñiz and Fonseca, 2019).

Phase 1. Scale design: A specialized theoretical review was conducted based on the object of study. The human thinking construct was first reviewed, followed by an in-depth exploration of creative thinking, focusing on models, theories, scales, and instruments. An external panel of three experts in the design and validation of psychometric scales related to sustainability and creative thinking collaborated to define the epistemological structure. Subsequently, the scale's dimensions, indicators, and items were established. The items, expressed as statements, were rated using a four-point Likert-type scale: 1= strongly disagree, 2= disagree, 3= agree, and 4= strongly agree.

Phase 2. Content validity evaluation: This phase involved evaluation by eight experts with backgrounds in sustainability, creative thinking, methodology, psychology, neuroscience, and university-level teaching. They assessed the relevance, representativeness, and clarity of the items and provided suggestions to improve their wording. Aiken's V coefficient was used to assess inter-rater agreement, with values above 0.8 considered acceptable (Penfield and Giacobbi, 2004).

Phase 3. Construct validity evaluation: The process began with a descriptive analysis of the study variables. The Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity were conducted to verify the suitability of exploratory factor analysis (EFA). The method of extraction was Varimax-rotated components (Goretzko et al., 2021). To confirm the

factorial structure obtained through EFA, confirmatory factor analysis (CFA) was performed using the maximum likelihood method, assuming normality of the data, Likert-type scaling, and appropriate factor loadings (Hu and Bentler, 1999).

Several goodness-of-fit indices were applied to assess the model's adequacy: the relative chi-square ( $\chi^2/df$ ), the root mean square error of approximation (RMSEA), the standardized root mean square residual (SRMR), the comparative fit index (CFI), and the Tucker-Lewis index (TLI).

Results

Scale design

The literature review and the initial proposal developed by the researchers led to the design of a scale, which was initially reviewed by three experts. As a result of this process, the scale was structured into four dimensions and 22 items designed to assess creative thinking (Table II).

Content validity evaluation

At this stage, the instrument was evaluated by eight experts. The results indicate that all values were acceptable, as they fell within the established confidence intervals (CI). According to Aiken's V coefficient (Aiken, 2003), all items received a very favorable assessment ( $V > 0.89$ ), except for item 21, which was excluded. The most relevant items were 3, 7, 14, and 15 ( $V = 1.00$ ; 95% CI= 0.89–1.00); the most representative were 2, 9, 17, and 20 ( $V = 1.00$ ; 95% CI= 0.89–1.00); and the clearest were 1, 4, 12, 13, and 20 ( $V = 1.00$ ; 95% CI= 0.89–1.00). Based on these results, the scale demonstrates content validity (Table III).

Construct validity evaluation

Preliminary analysis of the scale employing statistical tests made it possible to determine the mean, standard deviation (SD), asymmetry, kurtosis coefficient, and communalities (Table IV). The skewness and kurtosis values do not exceed the range of  $\pm 1.50$  (Pérez and Medrano, 2010).

For the application of exploratory factor analysis (EFA), the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity were performed. The KMO value was 0.893, and Bartlett's test yielded  $\chi^2 = 3431.302$ ,  $df = 295$ ,  $p < 0.000$ . These results confirm the suitability of applying matrix analysis through EFA (Goretzko et al., 2021). Item 22 showed a communality value below 0.30 and was therefore excluded for the revised analysis. As a result, the final version of the scale was organized into four dimensions as follows: Reality assessment (items 1, 2, 3, 4, and 5); Self-cultivation (items 6, 7, 8, 9, 10, and 11); Organization of experience (items 12, 13, 14, and 15); and Metacognition (items 16, 17, 18, 19, and 20) (Table V).

Cronbach's alpha was applied, and all dimensions yielded values above 0.7, indicating satisfactory internal consistency. Regarding explained variance, the dimension Reality assessment accounted for 22.442%, Self-cultivation for 18.839%, Organization of experience for 15.465%, and Metacognition for 12.414%. The total variance explained by the four dimensions was 69.16% (Table V).

In the confirmatory factor analysis (CFA), all items showed factor loadings above 0.5 and were thus considered significant, except for item 17, which had a loading of 0.41 and was subsequently eliminated (Hair et al., 2014) (Table VI).

TABLE II  
PRELIMINARY DEFINITIONS ON THE DIMENSIONS OF THE CREATIVE THINKING SKILLS SCALE FROM THE SDGS

Dimension	Definition	Items
Reality assessment	It refers to the evaluation of paradigmatic descriptions of what is understood as reality, truth, possibility, impossibility, and life, all of which are considered fundamental imaginaries.	1, 2, 3, 4, 5
Self-cultivation	It is the ongoing process of evaluation and personal improvement in every aspect of life experience	6, 7, 8, 9, 10, 11
Organization of experience	It refers to how meaning is constructed and integrated into life experiences, allowing them to contribute to personal goals.	12, 13, 14, 15
Metacognition	It refers to self-awareness that guides the design of strategies to efficiently and responsibly manage available options before making decisions, aligning them with the achievement of a goal.	16, 17, 18, 19, 20, 21, 22

Source: Author's own elaboration.

TABLE III  
AIKEN'S V COEFFICIENT ACCORDING TO THE CRITERIA OF RELEVANCE, REPRESENTATIVENESS, AND CLARITY OF  
CONTENT VALIDITY

Item	Relevance				Representativeness				Clarity			
	M	SD	V	CI 95%	M	SD	V	CI 95%	M	SD	V	CI 95%
1	2.96	0.45	0.97	0.82-0.98	2.84	0.60	0.93	0.85-0.97	3.04	0.39	1.00	0.89-1.00
2	2.90	0.53	0.95	0.76-0.99	3.04	0.39	1.00	0.89-1.00	2.84	0.60	0.93	0.85-0.97
3	3.04	0.39	1.00	0.89-1.00	2.80	0.66	0.89	0.72-0.94	2.80	0.66	0.89	0.72-0.94
4	2.96	0.45	0.97	0.82-0.98	2.80	0.66	0.89	0.72-0.94	3.04	0.39	1.00	0.89-1.00
5	2.84	0.60	0.93	0.85-0.97	2.96	0.45	0.97	0.82-0.98	2.90	0.53	0.95	0.76-0.99
6	2.80	0.66	0.89	0.72-0.94	2.90	0.53	0.95	0.76-0.99	2.80	0.66	0.89	0.72-0.94
7	3.04	0.39	1.00	0.89-1.00	2.84	0.60	0.93	0.85-0.97	2.84	0.60	0.93	0.85-0.97
8	2.84	0.60	0.93	0.85-0.97	2.90	0.53	0.95	0.76-0.99	2.90	0.53	0.95	0.76-0.99
9	2.80	0.66	0.89	0.72-0.94	3.04	0.39	1.00	0.89-1.00	2.96	0.45	0.97	0.82-0.98
10	2.90	0.53	0.95	0.76-0.99	2.80	0.66	0.89	0.72-0.94	2.80	0.66	0.89	0.72-0.94
11	2.96	0.45	0.97	0.82-0.98	2.96	0.45	0.97	0.82-0.98	2.90	0.53	0.95	0.76-0.99
12	2.80	0.66	0.89	0.72-0.94	2.90	0.53	0.95	0.76-0.99	3.04	0.39	1.00	0.89-1.00
13	2.90	0.53	0.95	0.76-0.99	2.96	0.45	0.97	0.82-0.98	3.04	0.39	1.00	0.89-1.00
14	3.04	0.39	1.00	0.89-1.00	2.84	0.60	0.93	0.85-0.97	2.84	0.60	0.93	0.85-0.97
15	3.04	0.39	1.00	0.89-1.00	2.90	0.53	0.95	0.76-0.99	2.96	0.45	0.97	0.82-0.98
16	2.90	0.53	0.95	0.76-0.99	2.96	0.45	0.97	0.82-0.98	2.90	0.53	0.95	0.76-0.99
17	2.84	0.60	0.93	0.85-0.97	3.04	0.39	1.00	0.89-1.00	2.80	0.66	0.89	0.72-0.94
18	2.80	0.66	0.89	0.72-0.94	2.84	0.60	0.93	0.85-0.97	2.80	0.66	0.89	0.72-0.94
19	2.96	0.45	0.97	0.82-0.98	2.80	0.66	0.89	0.72-0.94	2.84	0.60	0.93	0.85-0.97
20	2.90	0.53	0.95	0.76-0.99	3.04	0.39	1.00	0.89-1.00	3.04	0.39	1.00	0.89-1.00
21	2.65	0.53	0.72	0.76-0.99	2.79	0.45	0.78	0.82-0.98	3.11	0.60	0.82	0.85-0.97
22	2.89	0.45	0.97	0.82-0.98	2.94	0.60	0.93	0.85-0.97	3.01	0.39	1.00	0.89-1.00

Source: Author's own elaboration.

TABLE IV  
DESCRIPTIVE STATISTICS

Items	Mean	SD	Asymmetry	Kurtosis	Commonality
1	2.31	0.67	-0.57	-0.45	0.757
2	2.65	0.82	0.05	-0.49	0.646
3	2.12	0.64	-0.19	-0.92	0.796
4	2.17	0.69	-0.10	0.34	0.561
5	2.59	0.72	0.09	-0.98	0.683
6	2.78	0.59	-0.32	-0.47	0.504
7	2.14	0.68	-0.08	-0.52	0.794
8	2.29	0.76	0.12	0.46	0.723
9	2.20	0.87	-0.52	-0.65	0.631
10	2.31	0.93	0.03	-0.84	0.607
11	2.67	0.64	-0.72	0.27	0.587
12	2.69	0.76	0.01	-0.17	0.540
13	2.56	0.73	0.03	-0.62	0.648
14	2.32	0.59	-0.42	-0.35	0.701
15	2.48	0.84	0.17	-0.85	0.642
16	2.11	0.95	-0.58	-0.42	0.538
17	2.27	0.92	-0.19	0.36	0.648
18	2.74	0.81	-0.72	-0.78	0.541
19	2.48	0.77	0.29	-0.52	0.705
20	2.29	0.74	-0.39	-0.17	0.673
21	2.17	0.98	-0.76	0.63	0.505

Source: Author's own elaboration.

The results of the goodness-of-fit indices support the proposed theoretical model. The RMSEA was below 0.06, and the Tucker-Lewis Index (TLI) and Comparative Fit Index (CFI) both exceeded 0.95 (Kaplan, 1990). These indicators confirm that the model conforms to the assumptions underlying the theoretical proposal (Table VII).

Regarding the invariance analysis, a multigroup evaluation was conducted based on gender, including metric and scalar models. According to Cheung and Rensvold's criteria (Chen, 2007), the differences in CFI and TLI values were less than 0.01, indicating no evidence to reject the hypothesis of measurement invariance (Table VIII).

Furthermore, the differences between the RMSEA values of the configurational, metric, and scalar models did not exceed 0.015, confirming that the model operates similarly across demographic groups.

The final version of the scale of creative thinking skills from the perspective of sustainable development is presented in Table IX. The validated scale comprises four dimensions and 19 items:



TABLE V  
EXPLORATORY FACTOR ANALYSIS, EXPLAINED VARIANCE (EXPLAINED VAR.) AND CRONBACH'S ALPHA (CRONBACH'S A)

Items	Dimensions			
	Reality assessment	Self-cultivation	Organization of experience	Metacognition
1	0.64			
2	0.76			
3	0.59			
4	0.81			
5	0.74			
6		0.83		
7		0.76		
8		0.58		
9		0.64		
10		0.62		
11		0.79		
12			0.80	
13			0.52	
14			0.65	
15			0.62	
16				0.62
17				0.79
18				0.68
19				0.67
20				0.84
Explained Var.	22.442%	18.839%	15.465%	12.414%
Cronbach's $\alpha$	0.89	0.90	0.83	0.82

Source: Author's own elaboration.

TABLE VI  
FACTOR LOADINGS

Factor	Item	$\lambda$	$p$	CI 95%
Reality assessment	1	0.58	<0.001	0.45-0.67
	2	0.62	<0.001	0.51-0.70
	3	0.67	<0.001	0.56-0.75
	4	0.71	<0.001	0.61-0.80
	5	0.62	<0.001	0.51-0.70
Self-cultivation	6	0.65	<0.001	0.54-0.73
	7	0.59	<0.001	0.46-0.68
	8	0.72	<0.001	0.62-0.76
	9	0.60	<0.001	0.47-0.69
	10	0.68	<0.001	0.57-0.74
	11	0.52	<0.001	0.41-0.59
Organization of experience	12	0.67	<0.001	0.56-0.75
	13	0.56	<0.001	0.43-0.65
	14	0.69	<0.001	0.58-0.75
	15	0.72	<0.001	0.61-0.79
Metacognition	16	0.59	<0.001	0.46-0.68
	17	0.41	<0.001	0.63-0.77
	18	0.75	<0.001	0.64-0.78
	19	0.61	<0.001	0.48-0.68
	20	0.66	<0.001	0.55-0.73

Source: Author's own elaboration.

Reality appraisal (five items), Self-cultivation (six items), Experience organization (four items), and Metacognition (four items). The definition of each dimension is as follows:

The scale includes four dimensions. The first, reality appraisal, refers to the examination of reality and truth, along with the recognition of both possibilities and limitations that shape fundamental and transcendental imaginaries. This dimension encourages the development of actions informed by a holistic perspective and grounded in universal values, conceived as virtues that support sustainable development. The second, self-cultivation, is defined as a continuous process of self-evaluation that enables the identification of repetitive, cyclical, and limiting thought patterns, fostering transcendence through creative thinking. It involves the practice of meditation aimed at promoting a fulfilling life based on the principles of sustainable development at personal, family, social, and global levels. The third, organization of experience, describes the way in which experiences are structured and interpreted to construct meaning. These experiences contribute to personal purpose, with a focus on the present in a balanced manner, facilitating harmonious relationships with oneself, nature, and other living beings. Finally, the fourth dimension, metacognition, involves self-awareness in designing strategies for the efficient and responsible management of available options in decision-making processes, contributing to personal well-being and sustainable development, with an emphasis on well-being and the common good.

## Discussion

The challenges posed by sustainable development foster creative thinking as a pathway for generating transcendental contributions that benefit society (Pinkow, 2023). This capacity may enhance the development of ideas aligned with sustainable development by addressing the complex nature of environmental and social issues with global relevance.

In relation to the Reality appraisal dimension, creative thinking skills emerge as a critical element for advancing sustainable development (Zainuri and Huda, 2023). With regard to Self-cultivation, this dimension encompasses processes through which individuals acquire abilities and develop competencies that contribute to the improvement of personal well-being (Bertella and Castriotta, 2024).

Concerning the Organization of experience, creative

TABLE VII  
CONFIRMATORY FACTOR ANALYSIS

Model	$\chi^2$	Df	$\chi^2/\text{df}$	RMSEA	TLI	CFI
Original	307.439	139	2.21	0.035	0.976	0.965

Df: Degrees of freedom; RMSEA: Root mean square error of approximation; TLI: Tucker- Lewis index; CFI: Comparative fit index. Source: Author's own elaboration.

thinking supports the generation of innovative approaches that optimize resource use, reduce environmental impact, and promote social equity. Within this framework, organizational creativity not only drives operational improvements but also facilitates the construction of more responsible and conscious models of interaction with others (Saleh and Brem, 2023).

In relation to Metacognition, this dimension involves awareness and regulation of cognitive processes, positioning creative thinking as an essential component in addressing both local and global challenges (Hanisch and Eidorsh, 2023). In this regard, creativity enhances adaptability and cognitive flexibility, which are essential for

understanding the complexity of contemporary societal problems and tensions (Drigas *et al.*, 2023).

## Conclusions

The present study has resulted in the development of a scale for assessing creative thinking skills from the perspective of the Sustainable Development Goals (SDGs) in university students. This contributes to the formulation of teaching strategies that promote the development of competencies aimed at addressing local deficiencies and fostering societal progress.

In addition, the findings underscore the importance of conceptualizing creativity as a core driver of

TABLE VIII  
ANALYSIS OF FACTORIAL INVARIANCE

Model	$\chi^2$	Df	$\chi^2/\text{df}$	RMSEA	TLI	CFI	$\Delta\text{RMSEA}$	$\Delta\text{TLI}$	$\Delta\text{CFI}$
Configural	515.4	297	1.73	0.028	0.967	0.957	-	-	-
Metric	538.4	312	1.72	0.027	0.968	0.956	0.001	-0.001	0.001
Scalar	559.4	327	1.71	0.027	0.967	0.956	0.001	0.000	0.001

Df: Degrees of freedom; RMSEA: Root mean square error of approximation; TLI: Tucker-Lewis index; CFI: Comparative fit index;  $\Delta\text{RMSEA}$ : Variation in root mean square error of approximation;  $\Delta\text{TLI}$ : Variation in Tucker-Lewis index;  $\Delta\text{CFI}$ : Variation in comparative fit index Source: Author's own elaboration.

TABLE IX  
FINAL VERSION OF THE SCALE CREATIVE THINKING SKILLS FROM THE PERSPECTIVE OF SUSTAINABLE DEVELOPMENT (SDGS) IN UNIVERSITY STUDENTS

Model	Items
Reality assessment	1. I recognize that the reality I inhabit is complex and multi-causal.
	2. I integrate each point of view with my own to effectively and holistically approach reality.
	3. I generate thoughts that value qualities such as beauty, love, gratitude, and compassion.
	4. I accept my mental potentialities and characteristics.
	5. I value the connectedness of all living things as a path to sustainable development.
Self-cultivation	6. I identify when repetitive, reactive, cyclical, and limiting thoughts predominate in me.
	7. I transcend limited patterns of thought by adopting paradigms or archetypes that support an integrative perspective on sustainable development.
	8. I am in a permanent process of self-evaluation and transcendence of my limitations.
	9. I silence my thoughts and practice meditative states or contemplation of reality.
	10. I use meditative states or contemplative practices to generate thoughts aligned with my goals.
	11. I evaluate the impact that actions originating from my thoughts could have on real situations.
Organization of experience	12. I promote free and unbiased thinking to enhance my personal development.
	13. I approach my life experiences as opportunities to optimize my thoughts.
	14. I focus my mind and attention on the present in a balanced and harmonious way.
	15. I shape my thoughts to harmoniously interconnect with my environment and all living beings.
	16. I focus my thoughts not only on solving problems but also on creating realities in accordance with my objectives.
	17. I align my thinking, language, action, and emotion in the best possible way to achieve my objectives.
	18. I focus my learning on promoting my well-being and sustainable development for humanity.
	19. I align my thoughts and desires to serve the common good.

Source: Author's own elaboration.

innovation in the context of sustainable development. This perspective necessitates a deeper understanding of the cognitive and social mechanisms involved in the generation of creative ideas.

The study also presents certain limitations that should be acknowledged, as they offer valuable directions for future research. Specifically, the use of a non-probabilistic convenience sample may restrict the generalizability of the results due to limited representativeness.

The findings have both theoretical and practical implications. Theoretically, the study introduces a model that frames creative thinking through the lens of sustainability. Practically, the results may inform the design of educational strategies that promote holistic competencies to support decision-making aligned with the SDGs.

Finally, creative thinking is a highly complex and dynamic construct, and its conceptualization requires the integration of advanced theoretical frameworks, including complex thinking, complexity sciences, neuroscience, quantum theory, and ancestral knowledge.

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## PENSAMIENTO CREATIVO Y DESARROLLO SOSTENIBLE: DISEÑO Y VALIDACIÓN DE UNA ESCALA PARA ESTUDIANTES UNIVERSITARIOS

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### RESUMEN

El pensamiento creativo es reconocido como esencial para mejorar el bienestar personal y social, así como para afrontar los desafíos contemporáneos. El desarrollo de habilidades de pensamiento creativo contribuye al logro de los Objetivos de Desarrollo Sostenible (ODS). En este sentido, la integración del pensamiento creativo con los ODS proporciona a las personas las herramientas necesarias para implementar prácticas sostenibles. El objetivo de esta investigación fue diseñar y va-

lidar una escala para evaluar las habilidades de pensamiento creativo desde la perspectiva del desarrollo sostenible en estudiantes universitarios. La principal contribución de este estudio es su énfasis en el desarrollo de habilidades de pensamiento creativo desde un enfoque orientado a los ODS. Los resultados sugieren que fomentar estas habilidades puede impulsar innovaciones que benefician a la sociedad en tiempos de incertidumbre.



## PENSAMENTO CRIATIVO E DESENVOLVIMENTO SUSTENTÁVEL: ELABORAÇÃO E VALIDAÇÃO DE UMA ESCALA PARA ESTUDANTES UNIVERSITÁRIOS

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### RESUMO

*O pensamento criativo é reconhecido como essencial para promover o bem-estar pessoal e social, bem como para enfrentar os desafios contemporâneos. O desenvolvimento de habilidades de pensamento criativo contribui para o alcance dos Objetivos de Desenvolvimento Sustentável (ODS). Assim, a integração do pensamento criativo com os ODS fornece às pessoas as ferramentas necessárias para implementar práticas sustentáveis. O objetivo desta pesquisa foi elaborar e validar*

*uma escala para avaliar as habilidades de pensamento criativo sob a perspectiva do desenvolvimento sustentável em estudantes universitários. A principal contribuição deste estudo é a ênfase no desenvolvimento de habilidades de pensamento criativo a partir de uma abordagem orientada aos ODS. Os resultados sugerem que o incentivo a essas habilidades pode impulsionar inovações que beneficiem a sociedade em tempos de incerteza.*