



SYSTEMATIC REVIEW

Transformative pedagogies from innovation in times of planetary crisis. A systematic review of the literature

Pedagogías transformadoras desde la innovación en momentos de crisis planetaria. Una revisión sistemática de la literatura

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ABSTRACT

The article examines the scientific advances about transformative pedagogies that are addressed from the global challenges that are currently presented in humanity marked by a profound ecological, social and political crisis, before which arises the need to rethink education systems, due to the constant dynamics of environmental devastation, inequality and conflict that characterize our era require urgent and transformative responses from education. Taking into account the ecological crisis and the social and economic implications that arise, the promotion of social change and sustainability has been identified as a priority. At the methodological level, a systematic review of the literature was carried out, identifying three main variables: transformative education and sustainable development; curriculum and environment towards sustainable education; and transformative education and climate change. In this sense, the results identified the main lines of action and interdisciplinarity that foster the development of critical thinking and guide the participation of the communities from the pedagogical aspects inside and outside the classroom. By way of conclusion, an emphasis is made on the epistemological variety that addresses the specific psychosocial problems that require a solution to generate changes focused on the construction that allow from the cultural guidelines to articulate the learning outcomes in an effective implementation of educational systems.

Keywords: Transformation; Sustainability; Leadership; Empowerment; Interdisciplinarity; Epistemological Diversity.

RESUMEN

El artículo examina los avances científicos acerca de las pedagogías transformadoras que se abordan desde los desafíos globales que se presentan actualmente en la humanidad marcada por una profunda crisis ecológica, social y política, ante lo cual surge la necesidad de repensar los sistemas educativos, debido a las constantes dinámicas de devastación ambiental, desigualdad y conflicto que caracterizan a nuestra era exigen respuestas urgentes y transformadoras por parte de la educación.. Teniendo en cuenta la crisis ecológica, las implicaciones sociales y económicas que se suscitan se ha identificado como prioridad el fomento del cambio social y la sostenibilidad. A nivel metodológico se realizó una revisión sistemática de la literatura que identificó tres variables principales: educación transformadora y desarrollo sostenible; currículo y medio ambiente hacia una educación sostenible y educación transformadora y cambio climático. En este sentido los resultados arrojados identifican los principales ejes de acción e interdisciplinaria que fomentan el desarrollo de pensamiento crítico y guían la participación de las comunidades desde los aspectos pedagógicos dentro y fuera de las aulas de clase. A manera de conclusión, se realiza un énfasis en la variedad epistemológica que aborda las problemáticas psicosociales concretas que requieren una solución para

generar los cambios enfocados a la construcción que permitan desde los lineamientos culturales articular los resultados de aprendizaje en una implementación efectiva de los sistemas educativos

Palabras clave: Transformación; Sostenibilidad; Liderazgo; Empoderamiento; Interdisciplinariedad; Diversidad Epistemológica.

INTRODUCTION

The current crisis on the planet is related to climate change, loss of biodiversity, and environmental degradation. It suggests to humanity the approach of changes that are a priority to establish in the framework of the responses that require a transformation process due to the implications that are presented in society.⁽¹⁾ This is why, from education as a disciplinary area, the problems related to effective and timely actions that lead to the development of a sustainable future are identified. Within this analysis, transformative pedagogies play a very important role because the planetary crisis requires an educational approach focused on how the transmission of knowledge, attitudes, and values toward sustainability behaviors is conceived and addressed comprehensively.⁽²⁾

In this sense, transformative pedagogies present within their approach an educational focus that transcends the traditional model of teaching and learning contexts.⁽³⁾ The promotion of activities from a critical awareness and with active participation leads to the development and implementation of social determinants.⁽⁴⁾ Given the characteristics of transformative pedagogies, these from conceptual and methodological aspects are characterized by a commitment adjusted from social justice, the relational constructs of the individual facing sustainability under an integral perspective focused on the understanding of global challenges.⁽⁵⁾

Transformative pedagogies focus on developing in students a critical awareness that addresses environmental problems involving social aspects that currently refer to an implication from the postulates of the sustainable development model.⁽⁶⁾ The conditions of inequality accentuate the planetary crisis, determining the degradation of ecological systems in the face of the interconnectedness of individuals' social contexts.⁽⁷⁾ As indicated it is necessary to develop an active promotion in the identification of solutions generated from the collectives in which awareness of the issues and research activities lead to participation in actions to mitigate the environmental impact.

The establishment of interdisciplinary approaches from the pedagogical aspects makes an opening and holistic view of the planetary crisis, approached from the complexity that requires the integration of knowledge and the articulation of meaningful connections that are generated between the learning processes within the classroom and the impact on local and global communities.⁽⁸⁾ Collaborative work between different educational institutions and environmental organizations addresses environmental problems in a concrete way and in a continuous search for solutions that contribute to the mitigation and elimination of environmental impact. In this way, personal and social transformation is promoted based on the development of values that embrace empathy, responsibility, and justice, guiding actions that promote equity and sustainability.⁽⁹⁾

Finally, transformative pedagogies focused on addressing the planetary crisis promote forceful actions that focus on changes directed toward the development of a critical consciousness, which fosters actions and determinants that lead to environmental justice.⁽¹⁰⁾ This systematic review generates an analysis focused on the approaches, trends, contributions, and methodologies used in the research advances that provide an updated vision based on the understanding of the current environmental crisis, which implies a promotion from transformative education that addresses the priority challenges of the planet from a holistic perspective.

METHOD

The methodology used is quantitative based on systematic reviews of the literature through the selection of data utilizing extraction based on the development of Boolean equations. This was done by mapping systematic studies, generating a review in perspective, and taking into account the advances made in the field of study.⁽¹¹⁾ The search is based on the research question, taking into account the scope of the study and the primary works that were identified, evaluated, and synthesized using scientific evidence taking into account PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses).

Protocol procedure

The research question guiding this research is What are the approaches and outcomes of transformative pedagogies in times of planetary crisis? The bibliographic search was carried out using the Wos Clarivate, Elsevier, and Pubmed databases, using Boolean equations and including inclusion and exclusion criteria.

Subsequently, the selection of the studies identified in the research reports was made taking into account the review by the researchers. Filtering the data by the quality assessment that determines the reliability and

validity of the data, using GRADE (Grading of Recommendations Assessment, Development, and Assessment). The extraction and subsequent analysis are carried out using a systematic approach based on the contributions of the research results related to the findings to establish the quantitative estimation of the intervention processes.

Finally, a presentation of the results is made, following the protocol of the PRISMA guide, which provides detailed information on the included studies, generating an assessment of the overall quality reported in the scientific evidence that allowed the identification of the selected studies in a clear and structured manner, ensuring the rigorous quality of the evidence-based review.⁽¹²⁾

Search strategy

The search was conducted in three databases WoS Clarivate, Elsevier and Pubmed. The searches were conducted in the period from 2019 to 2024, taking into account that the search was restricted to paediatric patients, using the following equations Transformative [All Fields] AND (“teaching” [MeSH Terms] OR “teaching” [All Fields] OR “pedagogies” [All Fields]) AND (“time” [MeSH Terms] OR “time” [All Fields] OR “times” [All Fields]) AND planetary [All fields] AND “crisis” [All fields] transformational [All fields] AND (“teaching” [MeSH terms] OR “teaching” [All fields] OR “pedagogies” [All fields]) AND (“climate change” [MeSH terms] OR (“climate” [All fields] OR “change” [All fields]) OR “climate change” [All fields]) AND (“sustainable development” [MeSH terms] OR (“sustainable” [All fields] AND “development” [All fields]) OR “sustainable development” [All fields]).

Inclusion criteria

Selected studies that specifically addressed the variable of transformative pedagogies were included. Likewise, articles addressing the issue of climate change and environmental sustainability were included. Within the time range, studies carried out in the last five years were included. The results of research that included empirical studies, theoretical reviews, case studies, descriptive studies with analytical cut, generating an understanding of the processes analysed, were included.

Exclusion Criteria

Studies were excluded if they did not meet the scientific criteria as they were published in specialised journals. Likewise, undergraduate and postgraduate theses, technical reports, abstracts and conferences, as well as essays were not included. In the same way, articles that did not contemplate the studied variables related to the results of the equations were eliminated. Regarding methodological quality, published research results that did not report data analysis or representative samples were eliminated. Duplicate files were excluded to ensure the quality of the review.

Selection of studies

Following the criteria of the PRISMA guidelines, in the selection and extraction of information, articles were thoroughly reviewed, taking into account reports from the WoS Clarivate, Elsevier and Pubmed databases. Duplicate articles were eliminated by examining the reports and titles together with the results and conclusions where compliance with the inclusion and exclusion criteria was determined. In the same way, and to validate the information, it was cross-checked by two of the researchers independently, calculating the agreements and disagreements between the reviewers. Finally, the studies were included as shown in the flow chart (figure 1).

Taking into account the research included, the information was cross-referenced in an Excel matrix that contemplated the analysis of the variables together with their analytical categories, indicating the methodological processes carried out. The data collection and cross-checking of the information was carried out by the study of agreements and disagreements that were resolved by comparing and contrasting the studied variables of transformative pedagogies and the current planetary crisis.

Assessment of data quality

The quality of the research was assessed using the “Primary Research Assessment Standard” taking into account the domains. Studies with a cut-off point of 0.80 Cronbach’s reliability were identified, which allowed for the selection of articles to be included and excluded. Likewise, the selection of information was carried out taking into account detection, attrition and information biases, contrasting the information by two reviewers.

RESULTS AND DISCUSSION

The flowchart (figure 1) illustrates the process of selection and elimination of 526 initially reported investigations. 107 studies were eliminated from the WoS Clarivate, Elsevier and Pubmed databases. 26 articles were selected by checking the titles, thematic relevance and the intervention process, which resulted in the following figure 1.

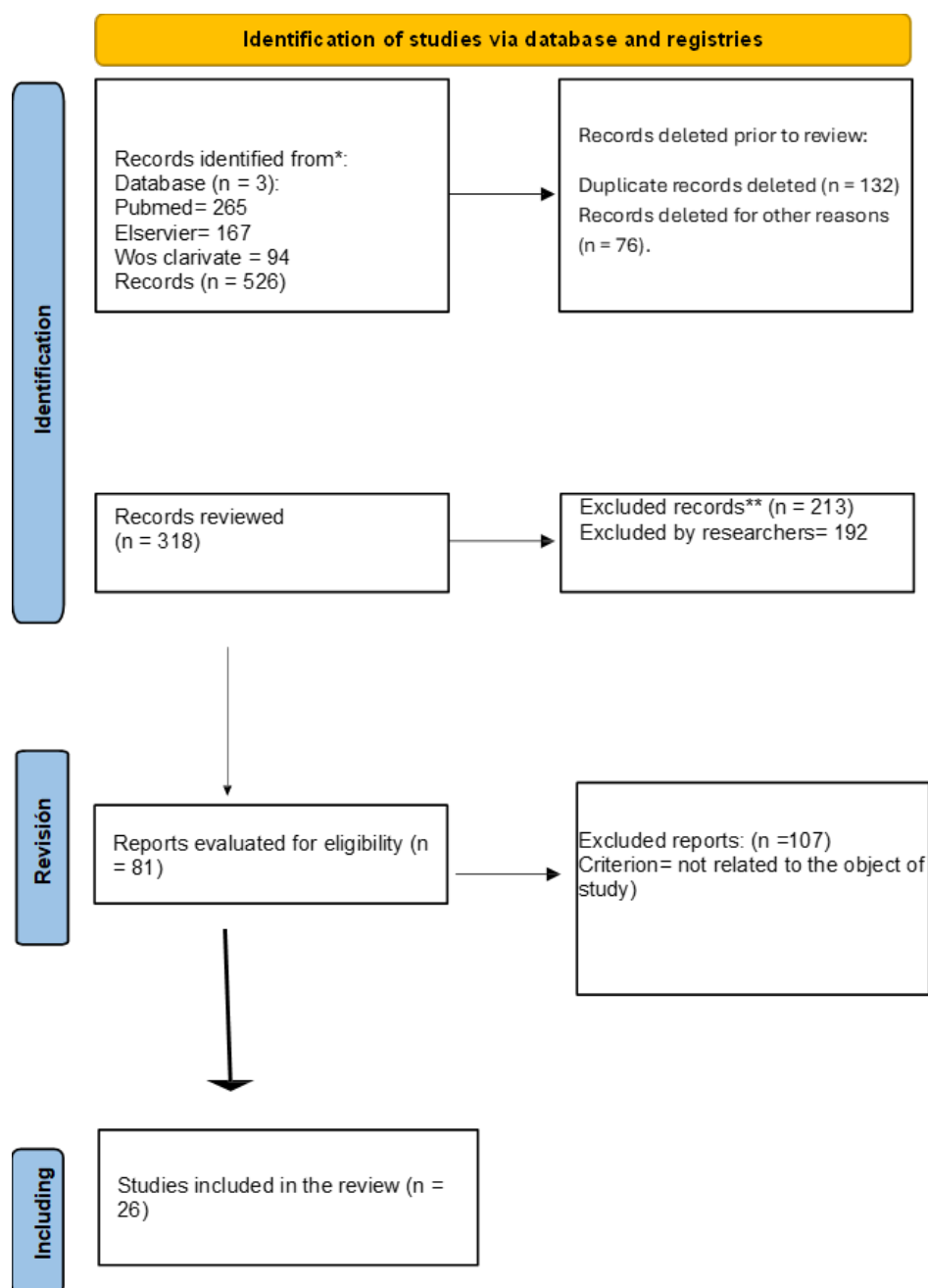


Figure 1. Flowchart

Analysis of variables

1. Transformative education and sustainable development

Education in sustainable development has generated in society a position of vital importance where learning processes and active pedagogies that seek to promote significant changes that shape transformative educational processes as a methodological variation that focuses on the development and promotion of a critical awareness from collective actions framed in the contributions towards the promotion of strategies to mitigate climate change, the challenges of addressing social inequality coupled with the economic problems that are currently experienced in the XXI century.⁽¹³⁾

Therefore, transformative education focuses on developing the transmission of knowledge and skills of individuals through the promotion of critical reflection and inter- and intra-personal processes that lead to social change. The focus of the objective is on empowering individuals as agents of transformation who can put into practice the solutions to the complexity of the problems that generate an environmental impact located at levels of economic and social inequality.⁽¹⁴⁾

Critical awareness and collective actions support the principles of social justice, citizen participation actions, and dialogue processes that lead to critical reflection. From transformative education, the development of knowledge transmission presents an integrative approach guided by an understanding of the interconnectedness

of social, economic, and social systems that facilitates decision-making in the face of challenges by addressing the need for changes that lead to sustainable lifestyles. Encouraging collaborative aspects, participatory networking, and generating alliances for change.⁽¹⁵⁾

2. Curriculum and environment towards sustainable education

The curricular development of educational programs generates challenges that focus on sustainable education, through the promotion of environmental awareness, the determination of actions to mitigate ecological damage, and the responsibility required to address environmental challenges. Educational planning involves incorporation of strategies directed towards the analysis and understanding of curricular contents, teaching methodologies strategies, and evaluation processes that are directed towards motivational integration actions of students in taking concrete steps toward sustainable education.⁽¹⁶⁾

The curriculum integration approach should incorporate the promotion and adoption of solutions to the climate crisis, the affectation of biodiversity and environmental degradation that requires the promotion of actions focused on individual and collective responsibility, integrating in a transversal way the development of skills and competencies of the curriculum in the face of environmental challenges.⁽¹⁷⁾ Contributing to the expansion of knowledge of effective sustainable education from a holistic and integrative approach that links the formation of individuals in a conscious, respectful, and committed way to the preservation of the environment.⁽¹⁸⁾

3. Transformative Education and Climate Change

Climate change currently represents one of the greatest challenges facing humanity. This problem requires changes that are a priority and require collective action; in this sense, transformative education is a tool that provides elements and resources that facilitate the approach. The changes required imply a relationship with the world and the natural environment, highlighting the potential for action towards a sustainable future. The complexity of the issue includes rising global temperatures, and accelerating glacier melt, coupled with significant loss of biodiversity and rising sea levels.⁽¹⁹⁾

The different strategies and approaches from transformative education include participatory learning, based on the analysis of problems through a critical and experiential approach that actively involves individual and collective actions aimed at changing values, behaviors, and attitudes that positively impact the transformation of the environment.⁽²⁰⁾ Contributing to the mobilization of awareness and facing the current challenges that involve an innovative pedagogical approach from educational institutions, governmental entities, collectives, and communities that work in an articulated way to face the environmental challenge.⁽²¹⁾ The following table 1 presents the results of the analysis of the systematic review.

The transformative pedagogies focused on addressing the planetary crisis establish within their premises that educational processes should focus on the capacity to develop critical thinking that leads to addressing environmental challenges and problems, promoting sustainable development through an integrative and holistic perspective. These determinants are supported by the contributions made ⁽⁴¹⁾ who indicate that the main environmental and social problems should not be addressed independently but require an interconnected approach that promotes the dynamics of understanding from social, environmental, economic, and ethical aspects.⁽⁴²⁾

In the context of educational processes, transformative pedagogies from the perspective of sustainable development and the approach to planetary crises, propose within their postulates the promotion of skills and attitudes from the promotion of values, respect for the dignity of the individual, empathy from environmental awareness and the promotion of decision-making capacity that allows acting in a responsible manner and through empowerment strategies.⁽⁴³⁾ The emphasis on the pedagogical actions of the students allows the development of active processes in which citizens are committed to the actions of positive transformation in society.⁽⁴⁴⁾

The implementation of transformative pedagogies requires a systemic approach that promotes collaborative spaces from the different actors, who denote in their proposals of approach the generation of ways of resolution against the approaches of the actions framed in transformative education and sustainable development.⁽³⁷⁾ Actions that are implemented from the understanding of the issues refer to greater processes of affectation and accelerate the negative changes in the planetary crisis.⁽³²⁾

In this sense and as raised,⁽³⁹⁾ transformative education and sustainable development are areas that in a complementary way sustain the aspects related to the foundation of changes in a deep way where the externalization of behaviors energized by individuals involves the promotion of social justice, the potentiation of skills, attitudes that are presented in terms of global citizenship and the promotion towards equity. Highlighting that the reflective aspects related to environmental issues motivate people to generate proposals focused on taking preventive measures that lead to meeting the needs through a balanced integration of social, contextual, and environmental aspects that promote the conservation of natural resources.⁽¹⁸⁾

Table 1. results of the analysis of the systematic review

N	Variable crosses	Authors	DOI	Methodology	Results	Country City
1	Transformative Education and sustainable development	(22)	0000000167413	Qualitative, descriptive and reflective	The educational processes from the paradigm of complexity carry out a critical reflection towards the planetary crisis that starts from the challenges and crises from the emergence that requires strengthening from the learning processes	Guayaquil Ecuador
2	Curriculum environment and	(23)	https://dx.doi.org/10.19137/praxiseducativa-2022-260102	Qualitative systematization of experiences	An articulation of social organizations and training structures in educational institutions is necessary. Which contributes to sustaining dialogue and generating contributions to the pedagogization of an environmental conflict.	La plata Argentina
3	Transformative Education and sustainable development	(13)	http://doi.org/10.18172/con.4489 LA	Quantitative through literature analysis in systematic review	Globalization in educational environments presents challenges in the face of changing situations. Education for sustainable development requires a rethinking from ecopedagogy, adapted to the social, economic, and environmental realities that imply changes in curricular plans.	Granada España
4	Transformative Education and sustainable development	(24)	N/A	Quantitative, explanatory with experimental-control design	The emphasis on planetary preservation requires a holistic pedagogy that includes ICT, because the transformation of advances allows us to contribute to the mitigation of ecological destruction from a more globalized and updated society.	Lima Perú.
5	Transformative education and climate change	(14)	DOI: 10.19136/pd.a31n72.3922	Qualitative through reflective analysis	Training in environmental pedagogy requires a perspective from complexity, because ecopedagogy configures a field of application that configures the social from the field of rural application oriented towards social transformation.	Tabasco México
6	Educación transformadora y cambio Climático	(25)	2665-3184	Mixed quantitative and qualitative with prototypical and categorical analysis.	The elements that constitute the social representation in the face of the reality of climate change identify that global warming, the greenhouse effect and political and social incidence represent a threat to the ecological balance of the planet that requires actions from Freire's liberating education focused on awareness.	Bogotá Colombia
7	Curriculum environment and	(26)	0719-4706	Qualitative reflective analysis	The establishment of programs and projects from Afro-Colombian cultural aspects addresses a pedagogical appropriation of ancestral knowledge and interculturality, which requires epistemological approaches that generate responses from environmental pedagogy.	Barranquilla Colombia
8	Transformative education and climate change	(27)	doi: 10.3389/feduc.2022.787490	Qualitative from a critical reflection	Current environmental crises require transformation processes from a pedagogical approach that address critical thinking through the inclusion of three interpersonal, intrapersonal and organizational levels, generating a transformative learning process.	Berlin Alemania

9	Transformative Education and sustainable development	(28)	https://doi.org/10.1080/14733285.2020.1870663	Qualitative descriptive and analytical	The dimensions of the climate crisis lead to developing a pedagogy of activism and leadership through a participatory approach that encompasses the interaction of educational transformation, empowering children and young people to mitigate social and environmental problems.	Cincinnati, USA
10	Curriculum and environment	(16)	https://doi.org/10.3390/su13052901	Multidisciplinary analysis from environmental education	Transformative education for a sustainable and sustainable world requires an articulation from pedagogy and the socioeconomic and cultural contexts, developing a community-centered approach.	Aghia Paraskevi, Greece
11	Transformative education and climate change	(19)	https://doi.org/10.1177/1541344620932310	Qualitative through case studies through interviews and observations	Educational actions focused on transformation from sustainability generate a positive impact on the development and learning of students, which implies an increase in pro-environmental actions, considering the construction of knowledge from the ontological and epistemological perspective.	Tel Aviv, Israel
12	Transformative Education and sustainable development	(28)	doi:10.1016/j.jclepro.2020.125336	Qualitative through narrative analysis of perceptions	It is identified that education focused on pedagogical processes leads to students developing interconnected learning between global society and commitments to the challenges of sustainability, generating greater understanding, recognition, and exploration of innovative solutions from sustainability	Helsinki, Finland
13	Curriculum and environment	(29)	https://doi.org/10.1080/13562517.2019.1586668	Qualitative through critical analysis	Environmental education models focused on education for sustainable development require an eco-pedagogical literacy process that generates transformative teaching by educators.	Los Angeles, USA
14	Transformative education and climate change	(30)	Doi 10.1108/IJSHE-04-2019-0152	Qualitative through reflective case study	Educational and pedagogical processes focused on education for sustainability imply taking into account the dimensions and internal capacities associated with the cognitive and socio-emotional processes that support	Lund, Sweden
15	Transformative Education and sustainable development	(31)	https://doi.org/10.3390/su12041374	Qualitative research review	The training of citizens is essential to understand and provide solutions to the problems of climate change and environmental sustainability.	Taipei Taiwan
16	Curriculum and environment	(18)	https://doi.org/10.3390/su11216104	Qualitative descriptive	The challenges of environmental sustainability represent an interaction between people and the environment. Involving making individual and collective decisions that must mitigate environmental, economic, and social problems	London United Kingdom
17	Transformative education and climate change	(21)	https://doi.org/10.29333/ejmste/103065	Qualitative descriptive and reflective documentary analysis	Environmental literacy is a need that must include interdisciplines, which implies even curricular development adjusted to needs.	Melbourne Australia
18	Transformative Education and sustainable development	(32)	https://doi.org/10.3390/su11164324	Qualitative analytical type	Learning from sustainability through the UNESCO proposal infers a learning process that is carried out from a progression that involves reflection by students in the conceptualizations and implementations of sustainability and environmental education.	Cambridge United Kingdom

19	Transformative education and climate change	(33)	https://doi.org/10.3390/su12239858	Quantitative literature review	systematic	The understanding and development of frameworks, models and competencies imply an analysis from the conceptualization of sustainability through the transformation of pedagogical strategies by promoting the competencies of educators.	Barcelona España
20	Curriculum and environment	(34)	https://doi.org/10.3390/su152014916	Quantitative literature review	systematic	The transformation towards environmental sustainability must promote the shaping of skills that address environmental, social and economic foundations, which implies transformative learning processes, from pedagogies oriented to action and effective development.	Sibiu, Romania
21	Transformative education and climate change	(35)	https://doi.org/10.1080/03098265.2020.1849066	Quantitative literature review	systematic	To address the problem of sustainability, processes based on active learning are required, which allow the identification of situations in a real way, promoting understanding and commitment on the part of students, based on critical and reflective thinking.	London, United Kingdom
22	Transformative education and climate change	(36)	https://doi.org/10.1016/j.cosust.2021.04.002	Qualitative through visual and archival research methods	type	Transformations towards sustainability require a transformation process, based on a praxis that generates hybrid alliances and develops potential aimed at generating skills in individuals that transform environmental realities.	Road, Brighton
23	Transformative Education and sustainable development	(37)	Doi: https://doi.org/10.1016/j.oneear.2020.04.010	Qualitative based on critical and reflective analysis		The transformation in sustainability requires changes in environmental behavior associated with a socioeconomic co-evolution that allows identifying and mitigating economic problems, moving towards a more equitable and sustainable world.	Pennsylvania United States
24	Curriculum and environment	(38)	https://doi.org/10.1525/elementa.390	Mixed with multi-method approach that included surveys, group discussions, a web portal and visual data.		Young people have a fundamental role in the face of the challenges of current climate change, which requires empowerment associated with changes in the educational system where teaching-learning processes are prioritized based on critical thinking and the development of creativity..	Oslo Norway
25	Transformative Education and sustainable development	(39)	https://doi.org/10.3390/su12072838	Mixed quantitative and qualitative with documentary approach and analysis of monitoring data		Education for sustainable development requires changes based on behaviors and associated psychological variables that encourage actions aimed at mitigating existing problems. Establishing a process of connection with nature and emotions, emphasizing relational and didactic education.	Berlin Germany
26	Transformative education and climate change	(40)	https://doi.org/10.1177/20427530211022951	Qualitative descriptive type		Due to the problems associated with climate change, it has been necessary to adopt technologies within pedagogical processes, increasing educational resources and greening school and university offerings aimed at reducing the degradation of the planet.	Melbourne, Australia

The promotion of sustainable development lays the foundations for understanding the challenges of the 21st century in terms of sustainable development, which in a globalized world requires priority attention from citizens.⁽²⁴⁾ Climate change and environmental degradation lead to an increase in greenhouse gas emissions, as well as a significant loss of biodiversity and deforestation, which have led to an increase in pollution levels. From the processes of transformative education, the premise is based on the adoption of measures to mitigate the effects of environmental changes that, according to the progress made, are focused on the transition to renewable energies, the adequate and sustainable management of natural resources, and the prospect of comprehensive training of individuals in the conservation of ecosystems.⁽³⁰⁾

In the same way, it is pointed out that the consumption processes of individuals and the excessive production in an unsustainable way generate a greater degradation of natural resources, generating a limitation of these on the planet. Because individuals increasingly make consumption patterns that do not allow the minimization of damage to the planet as mentioned.⁽¹⁹⁾ This implies that education processes should promote awareness of the proper use of resources, prospectively adopt cleaner production practices with the environment, and promote sustainable lifestyles that are based on reducing inequality and poverty gaps that generate a challenge from the promotion of equity and inclusion processes where the population has access to basic services.⁽⁴⁵⁾

The challenges of the XXI century,⁽⁴⁶⁾ from the aspects related to sustainable development, and climate change, require approaches that articulate the actions of collectives, organizations of individuals of a localized that promotes national actions and therefore the global aspects that are required by governments in generating a development of sustainable practices that mitigate the environmental impact, providing a context where the transforming educational aspects provide future generations with evident actions of changes that significantly impact the quality of life of the subjects, promoting a culture of sustainability that ensures human health and thus decrease the impacts on health, increasing the level of welfare.⁽²⁵⁾

The educational processes within their curricular aspects and the development of programmatic contents include and develop environmental issues, generated from the processes of transformative education awareness and promotion directed towards the understanding of the challenges currently faced in the globalized world.⁽⁴⁷⁾ The approach from the aspects of diversity in the experiences of individuals with the environment presents a direct impact on cultures, forms of interaction, and guarantees that lead to the promotion of environmental justice. Focusing students on active participation that promotes the protection and conservation of the environment in dynamic actions towards the development of skills and competencies that lead to the resolution of current environmental problems.⁽⁴⁸⁾

CONCLUSIONS

The proposed solutions to environmental challenges addressed by transformative pedagogies about curricular processes imply the promotion of actions related to the adoption of needs that meet local and national contexts in the availability of educational resources,⁽⁹⁾ are fundamental in the adequate promotion of environmental education and sustainability, being important to highlight that transformative pedagogies are necessary in addressing the planetary crisis since the proposed approach is based on the promotion of changes in thinking and behavior about the environment.

On the other hand, it was concluded that educational approaches are necessary for the proposals to address the sustainability and socio-environmental challenges that have increased the planetary crisis so that the curricular articulation is a process in which students and citizens should focus on strengthening the development of skills and competencies that denote an incidence from the solution proposals based on critical thinking through learning processes that promote relational autonomy and cooperation as a way of approaching the complexity of actions and global determinants in environmental matters.⁽⁶⁾

In the same way, the problems related to the planetary crisis must present an articulation from the interdisciplinary approach in which integration is made from the different fields of action that promote the approach of the processes and problems that denote greater complexity.⁽⁴⁰⁾ So from the aspects of transformative pedagogies, there is a synergy between formal processes and social environments that promote an articulation of equity, sustainability, and social justice. Emphasizing the importance of carrying out experiential educational processes that address real challenges through pragmatic solutions, using tools and skills provided within the training aspects suitable for this purpose.

Finally, it is necessary to solidify alliances and collaborations between governmental and educational institutions, non-governmental and non-profit organizations, and entities that articulate with the work and contributions made from local communities in which educational actors promote through transformative pedagogies positive and meaningful experiences that generate greater openness and commitments from the educational systems in line with public policies, through an educational approach that addresses the current planetary crisis.

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None.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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