Sulla strada della sostenibilità. Economia circolare e educazione come catalizzatori del cambiamento

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Sommario

Il cambiamento climatico è un problema interconnesso e globale che ha un impatto diretto sul benessere delle persone e sullo sviluppo delle società. L'economia circolare propone un modello di produzione e consumo che pone fine al modello tradizionale finalizzato a estrarre, produrre, utilizzare e gettare via, mirando a prolungare la vita utile dei prodotti e a ridurre il volume dei rifiuti generati. L'adozione di questo modello richiede il coinvolgimento dei cittadini e la creazione di meccanismi che promuovano la circolarità. In ambito educativo sono state adottate diverse prospettive, come l'educazione ambientale (EE), l'educazione allo sviluppo sostenibile (ESD) o, nel contesto spagnolo, l'educazione ambientale per la sostenibilità (ESS). Tutte queste prospettive si battono da anni per la sensibilizzazione e la consapevolezza ecologica della comunità educativa in termini di sostenibilità. Promuovere l'alfabetizzazione eco-sociale e l'educazione eco-centrica nelle scuole è l'opportunità di cui il pianeta ha bisogno.

Parole chiave

Economia circolare, Sviluppo sostenibile, Alfabetizzazione mediatica, Sostenibilità sociale, Cambiamento sociale.

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On the road to sustainability: Circular economy and education as catalysts for change

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Abstract

Climate change is an interconnected and global wicked problem that has a direct impact on the well-being of people and the development of societies. The circular economy proposes a model of production and consumption that puts an end to the traditional model of extract, produce, use and throw away and aims to extend the useful life of products and reduce the amount of waste. The adoption of this model requires the involvement of citizens and the creation of mechanisms to promote the circular economy. In the field of education, there are different approaches, such as Environmental Education (EE), Education for Sustainable Development (ESD) or, in the Spanish context, Environmental Education for Sustainability (ESS). They have all been working for years to raise the awareness and environmental consciousness of the educational community on sustainability issues. Promoting eco-social literacy and environmental education in schools is the opportunity the planet needs to act.

Keywords

Circular economy, Sustainable development, Media literacy, Social sustainability, Social change.

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Introduction

On September 23, 2019, a young Swedish woman addressed the representatives of the United Nations (UN) in New York with the following words: «For more than 30 years, the science has been crystal clear. How dare you continue to look away and come here saying that you're doing enough, when the politics and solutions needed are still nowhere in sight» (United Nations, 2019)».

How dare they? Greta Thunberg exclaimed several times during her speech at the Climate Action Summit. In a defiant speech, the climate activist powerfully and angrily accused politicians of inaction and a lack of solutions to the negative effects of climate change on future generations.

The need to address climate change systematically and globally has shaped the international agenda since the mid-20th century (Linnér & Wibeck, 2019). However, according to the various international organizations, there are problems that are already irreversible, but there is still time to mitigate the effects of climate change. We are in a scenario of climate emergency that affects the different populations of the planet unequally and unfairly and seriously threatens the continuity of life of species and humans on the planet. In a hopeless scenario, collective and coordinated action is needed to solve the anthropological problem facing humanity. Therefore, the message is clear: now or never.

The current model of society is unsustainable and focuses on the disproportionate consumption of resources and the degradation of the environment (Steffen et al., 2015). In recent years, there has been talk of a novel and innovative strategy that can be a breakthrough in the fight against climate change, reducing environmental impact and achieving climate neutrality: the circular economy (CE). Although there are numerous definitions and indicators related to this term (Moraga et al., 2019), the CE is an economic system that seeks the efficient use of available resources to produce products that avoid environmental impacts and negative consequences for the environment by simplifying production processes and waste to increase and optimize the durability of the products and services produced (Ellen MacArthur Foundation, 2017). However, its implementation is not an easy task since it requires the implementation of instrumental factors that entail fundamental socio-economic changes in our system (Cerdá Tena & Khalilova, 2016).

For an effective change in the production model, there must be a change of mentality in the citizenry and for this, the school and the media are two key elements. It is therefore necessary to rethink educational processes and improve communication processes to raise citizens' awareness of environmental issues and promote the transition from the linear model to the circular model.

Contextualization of the climate crisis and environmental problems

Science has shown that changing weather patterns herald an uncertain future for the planet (Kemp et al., 2022). Consequently, numerous government agencies, international and national organizations have declared an ecological emergency and climate crisis in the world under numerous terms.

The European Union (EU) declares an environmental climate emergency in Europe and worldwide as part of the United Nations Convention on Climate Change (COP25) held in Madrid in 2019. In Spain, the Council of Ministers declared a climate emergency in January 2020 through the Agreement on the Declaration of Climate and Environmental Emergency. It establishes a collective commitment to action based on the 2030 Agenda to tackle the climate crisis (MITECO, 2020b).

These representations recognize a global problem that humanity must face by developing solutions and strategies to overcome the negative effects of climate change. This problem is significantly worsening the living conditions of natural and animal species. Besides, there are many economic and social problems that are exacerbated by the climate crisis. The scarcity of resources, the water crisis, refugee crises, food shortages, rising prices... are examples that affect people's quality of life (United Nations, 2023a).

In an unusual context of great complexity, climate change is positioned as a complex, difficult-to-predict phenomenon whose effects are long-lasting (Cortés Vázquez, dos Santos Martins & Mendes, 2020). An interconnected, wicked problem that directly and indirectly affects social development in the Anthropocene era (Vivanco & Bravo-Benavides, 2022).

Since its establishment by the United Nations General Assembly in 1988, the Intergovernmental Panel on Climate Change (IPCC) has warned of the serious consequences caused by the negative effects of climate change on planet Earth (Pörtner et al., 2022). In the latest report, humans are named as the main culprit for the destruction of nature and the limitation of natural resources. This is clearly reflected in the definitions of climate change made by various institutions, in which they include the anthropogenic nature of the problem and blame human activity for the current climatic conditions (Bello Benavides, Alatorre Frenk & González-Gaudiano, 2016; United Nations, 1992).

In addition, environmental risks are linked to other problems and risks to the sustainability of life on Earth, such as economic, social, geopolitical or technological problems, and their magnitude is such that, according to the latest report on global risks by the World Economic Forum (2024), we are close to reaching the point of no return and universal action is needed for the sustainable development of the planet (Whalen et al., 2018).

Legislating against climate change: a look back in time

Despite the devastating future predicted in the main scientific reports due to the climate and environmental crisis (Willis, 2020), numerous legislative measures have been taken over the years in an international context characterized by the development of regulatory frameworks aimed at reducing the ecological impact on the planet. For more than half a century, the UN and the EU have adopted numerous measures to combat climate change and proposed solutions to reduce its negative impacts.

In 1972, the United Nations Environment Program (UNEP) was founded as part of the Stockholm Conference on the Human Environment (the first Earth Summit). Currently, it is the reference authority at the environmental level in the world, as it is responsible for defining the environmental agenda at the global level (UNEP, 2023).

In 1979, the first World Climate Conference was held in Geneva, convened by the World Meteorological Organization (WMO) to address climate issues such as global warming and climate change.

In response to concerns about global warming and the destruction of the ozone layer, UNEP and WMO established the Intergovernmental Panel on Climate Change (IPCC) in 1988 to produce reports assessing the impacts and its consequences for the world (IPCC, 2023).

The second World Climate Conference was held in Geneva in 1990. In October of the same year, the IPCC published its first assessment report (FAR), in which it warned about the state of the climate and became an international reference. Furthermore, climate change was recognized as a human concern that required a global response.

Given this urgency, the UN Conference on Environment and Development was convened in Rio de Janeiro in 1992 (the second Earth Summit). It was in this context that one of the world's most important events for establishing international measures to control the effects of climate change took place: the UN Framework Convention on Climate Change (UNFCCC) (United Nations, 1992).

On March 21, 1994, the UNFCCC entered into force and was ratified by 198 parties (197 countries and the EU). Spain signed the Convention in June 1992 and ratified it in December 1993. It establishes the Conference of the Parties (COP), a body responsible for regularly reviewing the agreements reached under the UNFCCC. All signatory parties to the UNFCCC take part in these regular meetings, making it one of the most important conferences on the international agenda.

The first COP took place in Berlin in March 1995. Since then, the COP has been held every year to review whether the agreements are being adhered to. In October of the same year, the second IPCC assessment was published: Climate

Change 1995 (SAR), which stated that climatic conditions are changing due to greenhouse gas emissions (IPCC, 2001).

In December 1997, COP3 established guidelines for action on carbon dioxide and greenhouse gas emissions, particularly in industrialized countries. This led to the signing of one of the most important international agreements to date, the Kyoto Protocol. The Protocol entered into force on February 16, 2005, and provides for monitoring mechanisms for the parties involved. Currently, 192 parties have ratified the Kyoto Protocol. Later, in 2012, a second commitment period from 2013 to 2020 was defined in the Doha Amendment at COP18, which took place in Doha, Qatar (United Nations, 2023b).

The Millennium Summit took place in New York in September 2000. In this context, 189 countries signed the Millennium Declaration with 8 goals to be achieved by 2015: the Millennium Development Goals (MDGs) (United Nations, 2000).

In October 2001, the IPCC Third Assessment Report: Climate Change 2001 (TAR) was published, which, among other things, updates the scientific knowledge on climate change and provides a framework for action to address climate change in the context of sustainable development. It also states that human activities such as the emission of greenhouse gasses have a direct impact on the global climate (IPCC, 2001).

The third Earth Summit was held in Johannesburg in August 2002. This World Summit on Sustainable Development took stock of the results of the previous summit (1992 in Rio de Janeiro) and renewed the political commitment to sustainable development (United Nations, 2002).

In September 2007, the fourth report of the IPCC was published. The report contains up-to-date information on observed climate change and its impacts on natural systems and human society. The causes of climate change, both natural and man-made, are analyzed. It also contains information on climate change projections and on short- and medium-term (before 2030) and long-term (after 2030) adaptation and mitigation options (IPCC, 2007).

In September 2009, the third World Climate Change Conference took place in Geneva, organized by the WMO in cooperation with the UNESCO, the UNEP and other international organizations. In this context, a framework for analyzing climate variability and change and the associated risks was created to improve climate information. In December 2009, at COP15 in Copenhagen, Denmark, the Copenhagen Accord set out measures to limit the global temperature increase to below 2 degrees Celsius, considering the information gathered in the fourth IPCC report (United Nations, 2009).

Twenty years after the first agreement in Rio, the UN Conference on Sustainable Development Rio+20, known as the fourth Earth Summit, took place in June 2012. As a result, the document *The Future We Want* was presented, which

contains measures and practices for sustainable development and reaffirms the commitment to achieve the Millennium Development Goals by 2015. Among them, education is mentioned as the main instrument for tackling the problems associated with sustainable development. In addition, the development of the Sustainable Development Goals (SDGs) is beginning to take shape in this document, as it recognizes the importance of formulating universal goals that aim to achieve global action for sustainable development.

In October 2014, the IPCC's Fifth Assessment Report (AR5) was published. In addition to identifying the rise in temperatures and greenhouse gasses, climate change due to human influence and assessing the risks and impacts of climate change in the future, this report also recognizes education as another approach to tackling the risks of climate change through adaptation. In reducing vulnerability and exposure to human development and social change (IPCC, 2014).

As a result of the working group established at the Rio+20 conference, the UN adopted the 2030 Agenda for Sustainable Development in September 2015 to take up the Millennium Development Goals and achieve the proposed targets within a 15-year action period. It includes the SDGs, 17 global goals and 169 targets where world leaders have committed to a common approach (United Nations, 2015b).

In December of the same year, COP21 took place in Paris, France. It is considered the most famous COP in history, as the first international climate agreement, the Paris Agreement, was concluded there. This agreement was signed by 195 parties.

Considering the findings of the fifth IPCC report, which recognizes the trend of rising temperatures on Earth, a legally binding agreement is concluded to limit the global temperature rise in the 21st century to 2 degrees Celsius and preferably to 1.5 degrees Celsius. The agreement, which entered into force on November 4, 2016, provides for a roadmap and assessment plans every five years. Article 12 of the Agreement (United Nations, 2015a, pp. 17-18) states that the Parties: «shall» cooperate in taking appropriate measures to improve education, training, public awareness and participation, and public access to information on climate change». Education, training, and awareness-raising thus became a cornerstone of the UN Plan of Action.

In the following years, COP22 (2016) was held in Marrakesh, COP23 (2017) in Bonn, COP24 (2018) in Katowice (Poland), COP25 (2019) in Madrid, Spain, COP26 (2021) in Glasgow (Scotland) and COP27 (2022) in Sharm el-Sheikh (Egypt). They all have a common goal: to ensure and strengthen compliance with the Paris Agreement.

In March 2023, the IPCC publishes its sixth assessment report: Climate Change 2023 (AR6). This report emphasizes the importance of increased action to address climate change and expresses the urgency of the situation (United Nations, 2023c).

In December 2023, the 28th Conference of the Parties (COP28) was held in Dubai, which concluded that the goal of limiting the temperature to 1.5 degrees Celsius is far from being achieved. In addition, although there is still no consensus, the Dubai Agreement establishes out the reduction of fossil fuels such as coal and expresses the desire to phase out the use of fossil fuels and instead use clean energy with low or no emissions.

Driving the transition towards circularity

Circular economy

The disproportionate increase in the consumption of products, in which industrialization represents a turning point, presents companies and institutions with the challenge of producing and delivering both resources and services in a sustainable way. On the other hand, the negative events of climate change primarily affect human existence, becoming globally unpredictable and creating uncertainties (Arora, 2019). Therefore, measures to tackle it are more necessary than ever. In recent years, it has been part of the global political, economic and social agenda, and solutions are being sought to combat the effects of climate change on society through policies, strategies and agreements aimed at mitigating it. Given the international call to seek common solutions to reduce the impact of climate change, responsible consumption systems are being established to achieve the SDGs set out in the 2030 Agenda. To this end, it is important to create alternatives to the linear consumption model: the circular economy (CE).

The CE is about redesigning production processes and creating an effective transition from a linear model to a circular model (Andrews, 2015). A transformative economic model (Ellen MacArthur Foundation, 2017), which appears to transform our system as it contributes to the reduction of greenhouse gasses and provides more durable and environmentally friendly products. It is based on 3 principles: Preventing waste and pollution, putting products and materials into circulation and regenerating nature.

Over the last ten years, the EU has been committed to the CE. The EU has committed to achieving climate neutrality by 2050 in the European Green Deal (European Commission, 2019). To this end, numerous proposals have been adopted, including the Climate Law and the new CE Plan.

The New CE Action Plan for a cleaner and more competitive Europe was adopted in March 2020. This plan promotes the development and integration of the CE to achieve a cleaner and more sustainable Europe and is based on a series of initiatives and a follow-up plan to serve as a transformative framework.

It also puts the CE at the service of citizens by promoting education, training and lifelong learning (European Commission, 2020).

In July 2021, the EU approves the Climate Law, which includes the commitment to comply with the Paris Agreement and achieve the SDGs. It provides a framework for measures to mitigate the effects of climate change.

At national level, a policy has been developed in recent years that is in line with EU directives. The Ministry of Ecological Transition and the Demographic Challenge has developed the First Action Plan for the CE 2021-2023 Spanish Strategy for the CE. It contains the axes and lines of action to achieve a sustainable and decarbonized economic model (MITECO, 2021). In addition, the National Plan for Adaptation to Climate Change 2021-2023 (PNACC) was published in 2020. It includes the CE as a new production and consumption model that is necessary to reduce the risks of climate change (MITECO, 2020a).

Although national and international legislation provides for a renewal and innovation of production models and strategies focused on reducing the waste generated by society, it is necessary to raise awareness and teach citizens responsible habits that allow them to participate in a participatory way in solving the environmental problem.

Education: the cornerstone in the fight against climate change

As outlined in the previous sections, the climate crisis and environmental emergency has been declared by numerous international organizations and agencies. The CE is positioned as a viable solution that can help reduce greenhouse gasses (GHG) and the negative effects of climate change.

However, in the face of this problem, it is necessary to create a social and collective commitment that promotes good practices that guarantee the sustainability of natural resources over time and develop environmental awareness (Morillo Rodriguez, Montserrat de la Paz & Murillo Sánchez, 2019). A commitment that requires the creation of an ecological culture that encompasses knowledge, perceptions, attitudes and behaviors (Pérez-Díaz & Rodríguez, 2016).

Since the signing of the United Nations Framework Convention on Climate Change (UNFCCC) in 1992, education has been present as a transformative element in achieving a sustainable world (United Nations, 1992).

Since then, education has become increasingly central to the various international, European and national policies related to the CE and climate change. In the European Parliament's report Closing the Loop (Bourguignon, 2016, p. 7): «The Parliament also pointed out that education and training policies must take into account the 'green skills' needed for the transition to a circular economy». In Spain, the National Plan for Adaptation to Climate Change (2021-2030) also

highlights the importance of strengthen the capacity of children and youth in climate change mitigation (MITECO, 2020a).

Education is the key to creating environmental awareness among young people. Since the UN gave visibility to the environmental problem, different educational and thought currents have tried to address the perspective of the environment and sustainable development in the context of education, proposing different approaches that enable social awareness (Heras et al., 2010).

In 1987, at the International Congress on Environmental Education and Training in Moscow, Russia, the concept of Environmental Education (EE) was defined as an «ongoing process in which individuals and communities develop an awareness of their environment and acquire the knowledge, values, skills, experience and also the determination to act individually and collectively to solve present and future environmental problems» (Martínez Castillo, 2010, p. 100).

In Spain, the White Paper on Environmental Education was published in 1999 (Ministry of the Environment, 1999). It not only explains the consequences of the climate crisis and the need to develop a model of sustainable development in line with contextual and social needs, but also the importance of environmental education as a tool for linking educational actions and environmental issues through citizen participation, research, information and training. This requires its transversal and interdisciplinary integration into the different educational contexts. This process must involve all citizens and society through a transversal and interdisciplinary approach.

In the 1990s, UNESCO emphasized the importance of education for sustainable development and proposed a broader concept that includes environmental education (EE): Education for Sustainable Development (ESD). This approach creates a framework that aims to achieve a sustainable future through education. It thus proposes a lifelong learning process in which knowledge, skills and values are acquired to meet the challenges of the climate crisis and environmental urgency.

This term has been used in numerous reports that address this perspective and evaluate learning processes related to ESD that mark the roadmap for linking sustainability to teaching and learning (Benayas & Marcén, 2019; UNESCO, 2009, 2012b). Furthermore, the differences between AE and ESD are clarified. ESD is a field that encompasses all areas of sustainability linked to the cultural sphere, including access to education and training, while ESD focuses on environmental work through the development of educational programs and critical thinking (UNESCO, 2012a).

The arrival of the 2030 Agenda and the SDGs give impetus to ESD as they create a common space for action in which strategies and measures for the development and implementation of ESD have been developed, reflecting the dimensions of action to address current issues (UNESCO, 2014, 2016, 2017a).

UNESCO also defines the key competencies, learning objectives, themes and pedagogical approaches that ESD should focus on (UNESCO, 2017b). In this, the CE in the context of the green economy is already one of the topics proposed to promote responsible production and consumption. In this sense, the transformative capacity of education to promote sustainable development is recognized to such an extent that: «Education becomes the engine of sustainable development and the key to a better world. Education can and must contribute to global sustainable development» (UNESCO, 2015, p. 32).

To put this into practice, the 2030 Sustainable Development Strategy is presented in Spain. This roadmap establishes education for sustainable development and global citizenship as a priority for action. It establishes the development of transversal sustainability skills to transform sustainability and address socio-environmental challenges (Ministry of Social Rights and Agenda 2030, 2021). In this context, the Action Plan «Environmental Education for Sustainability» (2021-2025) is presented, which establishes environmental education for sustainability as a framework of action.

Among the measures to be considered as part of the operational axis of communication, dissemination and citizen action is the education and training of professionals in environmental and CE issues.

In the changing context in which we find ourselves, the Spanish Education Law was reformed in 2020 (LOMLOE), which includes references to Education for Sustainable Development and the 2030 Agenda in its preamble for the first time. This opens a new horizon, in line with the European and UNESCO perspectives, an opportunity in which the multidimensional education of the student: to know how to do, to know how to be and to know how to live together (Delors, 1996).

From a broader perspective, environmental pedagogy is understood as an educational field that calls for pedagogical actions to offer and promote solutions to the climate crisis through education about nature (Sureda & Colom, 1989). For the different pedagogical perspectives to be implemented, a pedagogical approach is required that defines the ideological aspects, the didactics and methodology, the didactic means, the contents, the teachers and the students to whom the environmental pedagogical action is addressed (Boada & Escalona, 2005).

In this process, the school is positioned as a decisive actor to train citizens through participatory actions with the immediate environment. The results of this process should encourage the creation of consumption habits that support the commitment to the new sustainable paradigm based on the CE.

We are facing a major challenge in which we must ask ourselves if the commitments of governments are timely enough to promote a culture of environmental sustainability and cooperation and ensure that citizens understand and act accordingly in the face of the climate emergency. Therefore, bottom-up ac-

tions should be promoted (De Pascale et al., 2023), taking into account environmental pedagogy and the different educational perspectives that arise from the context and needs of each learning environment (Tovar-Gálvez, 2017), in order to promote attitudes, values, actions and movements that ensure the formation of critical, participatory and engaged citizens with the climate crisis and the environment (Flores, 2013).

A new horizon for media and ecosocial literacy

In an educational context where media are part of everyday life, new scenarios are emerging in which teaching-learning processes must be reformulated and aligned with the goals set by the 2030 Agenda. Educommunication thus promotes active participation in the learning process (Bonilla-del-río, García-Ruiz & Pérez-Rodríguez, 2018), starting from an expanded awareness (Freire, 2005) that promotes action and social change.

Therefore, from this perspective, addressing climate change, sustainable development and the CE can bring about the real change we need to overcome the climate crisis. This requires that participatory processes create new forms of interaction between the actors involved that enable critical thinking on environmental issues. Educational communication, starting from media literacy, is a fundamental axis to strengthen training and education for sustainable development and ensure a transformation process that is sustainable in the long term (Badillo Mendoza, 2014).

In a complex scenario, we must understand how we can develop informative and awareness-raising actions at school that promote the creation of responsible habits among citizens based on their environmental literacy.

To be environmentally competent, one must acquire values, attitudes, skills and knowledge in a holistic and transversal way. Murga-Menoyo and Bautista-Cerro (2022) point out that to develop an eco-social competence, an integral educational process must be developed that produces a competence that focuses on three aspects: Environmental Literacy, Global Citizenship Literacy and sustainability Literacy. This will lead to the development of key competencies for sustainability.

This learning process must change reality based on the students' own experiences (Prado, 2021), without forgetting their environment and the surrounding community.

The school is a privileged place to train committed citizens capable of promoting the change that the planet needs. In this space, metacognitive processes should be developed that allow them to become aware of environmental issues through critical reflection (Magno, 2010). To this end, pedagogical methods and resources are key to promoting active and engaged awareness (Freire, 1993; Leal

Filho et al., 2018). Teachers have a central role to play in this process. They must be able to develop the appropriate pedagogical methods and resources to achieve ecocentric education (Molina-Motos, 2019).

However, the need for teachers to be trained and updated in sustainability topics that include the CE cannot be ignored (Collazo Expósito & Geli de Ciurana, 2022). This training of educators should take place at all levels of the education system and focus on the development of specific solutions that enable participatory action (Blanco-Portela et al., 2020).

All this implies the development of activities in contextualized learning environments that allow the development of competences for climate action and that imply a real and lasting commitment against climate change, in short, a transformative educational action that manages to empower students individually, in the community and globally in an eco-social way.

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