


Transforming knowledge into action: The synergy between climate education and youth activism

 <https://doi.org/10.56238/sevened2024.013-006>

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ABSTRACT

Climate change poses an urgent challenge, impacting ecosystems and societies globally. Climate education (EduClima) emerges as an essential tool to empower young people to understand and act on climate issues. Movements such as Fridays for Future, led by young people such as Greta Thunberg, highlight the importance of youth activism in the fight against climate change. This chapter explores the interconnectedness between climate education and youth activism, arguing that an integrated approach is essential to addressing the climate crisis effectively. Climate education not only informs but also inspires action, preparing young people to become leaders in the pursuit of a sustainable future. However, challenges such as unequal access to education and institutional resistance must be overcome. Strategies such as the continuous training of educators and the use of digital technologies can strengthen climate education and youth activism, promoting a more resilient and conscious society. Collaboration between governments, NGOs and educational institutions is crucial to amplify the impact of these initiatives. This study concludes that climate education and youth activism are essential to promote a sustainable and resilient future, empowering young people to lead the fight against the climate crisis with knowledge and determination.

Keywords: Climate change, Climate education, Youth activism, Sustainability.

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INTRODUCTION

Climate change represents one of the greatest challenges of the 21st century, impacting ecosystems, economies and societies on a global scale. Phenomena such as heat waves, floods, droughts, storms, and forest fires have become more frequent and intense, exacerbated by human activities that alter natural systems (Nusche et al., 2024). These extreme weather events not only threaten environmental sustainability but also the survival and well-being of human populations. The Intergovernmental Panel on Climate Change (IPCC) warns that the window to avoid the worst impacts of climate change is rapidly closing, emphasizing the need for immediate action to mitigate and adapt to these changes (IPCC, 2021).

In this context, climate change education (EduClima) emerges as an indispensable tool, empowering young people to understand and act on climate issues (Fletcher, 2023). According to UNESCO (2021), climate change education is essential to enable young people to understand the science behind climate change, recognize the urgency of the situation, and adopt effective measures to mitigate and adapt to these impacts. According to UNESCO (2021), the integration of climate education into school curricula is essential to develop critical awareness and practical skills in young people, preparing them to act as agents of change. In many countries, initiatives to incorporate climate education into education systems have gained momentum, highlighting the crucial role of education in transforming students' perceptions of the environment and preparing for future challenges.

At the same time, youth activism has emerged as a powerful force in the fight against climate change. Movements such as Fridays for Future, initiated by Greta Thunberg, have mobilized millions of young people around the world to demand concrete action from governments and international institutions (Igini, 2022). Greta Thunberg, in a hard-hitting speech at the UN Climate Action Summit in 2019, stated: "You have stolen my dreams and my childhood with your empty words. And yet, I'm one of the lucky ones. People are suffering. People are dying. Entire ecosystems are collapsing" (Thunberg, 2019). This movement underscores the importance of giving young people a voice in climate policymaking and recognizes their crucial role in promoting social change. Young people who are well-informed and educated about climate issues are more likely to get involved in actions and social movements that seek to mitigate the impacts of climate change. As highlighted by O'Brien et al. (2018), education is a key factor that can transform the potential of youth activism into a powerful force for social and political change.

The interconnection between climate education and youth activism is evident. Climate education not only informs but also inspires action. Youth-led movements, such as Fridays for Future, have demonstrated that youth are a significant force in the global fight to preserve the environment.



However, the challenge is not only to educate, but also to motivate and empower young people to take action. Climate change education must go beyond the classroom, connecting academic learning with practical action and activism. Educational programs that involve students in sustainability projects and awareness campaigns can strengthen youth engagement and participation. Case analysis of extreme weather events, educational programs, and youth movements highlights the need to prepare future generations for environmental challenges and empower young people to become leaders in the pursuit of a sustainable future.

This chapter explores the interplay between extreme weather events, climate education, and youth activism. It is argued that an integrated approach, which combines educational capacity building with youth mobilization, is essential to effectively address the climate crisis. By exploring case studies and recent evidence, the chapter seeks to demonstrate how climate education and youth activism can together build a more resilient society prepared for future challenges. Through a case analysis of extreme weather events, educational programs and youth movements, the need to prepare future generations for environmental challenges and empower young people to become leaders in the pursuit of a sustainable future is highlighted.

Moreover, the impact of youth activism goes beyond simple awareness-raising. Young activists have been pushing world leaders to take more ambitious and responsible climate action. The influence of movements such as Fridays for Future shows that young people are not only victims of climate change, but also active agents of change. They are redefining the narrative and demanding concrete action for a more sustainable future.

Therefore, climate education and youth activism are complementary and interdependent. Together, they form a powerful approach to tackling the climate crisis. Education empowers young people with the necessary knowledge and skills, while activism channels this empowerment into concrete actions. Thus, the combination of these forces is essential in the fight against global warming and climate change.

EXTREME WEATHER EVENTS AND THEIR IMPLICATIONS

Extreme weather events have become increasingly frequent and intense due to climate change. According to the Intergovernmental Panel on Climate Change (IPCC), the increase in global temperatures is directly related to the increase in the frequency and severity of phenomena such as heat waves, droughts, floods, and storms (IPCC, 2021). Not only do these events cause immediate and visible damage, but they also have long-lasting implications for affected communities. Scientists attribute this significant increase to climate change caused by human activity, especially the emission of greenhouse gases. Understanding the relationship between these events and climate change is crucial for effective policymaking and mitigating future impacts.



Extreme weather events are characterized by significant deviations from normal weather conditions, occurring over short, specific periods. Climate change, on the other hand, refers to the long-term changes in Earth's average weather patterns, including temperature, precipitation, winds, and ocean currents (Nusche et al., 2024). These long-term changes not only influence the frequency but also the intensity of extreme weather events.

Over the past twenty years, the number of climate-related disasters has increased substantially, with floods and storms being the most common events. Recently, droughts, wildfires, and extreme temperatures have also become more frequent and severe. While low-income countries are the most impacted, climate risks are growing in high-income countries as well. In 2018, developed countries faced severe heatwaves and droughts, with Europe experiencing a drastic increase in the incidence of extreme heatwaves, making these events up to 100 times more likely than a century ago (Nusche et al., 2024).

The impacts of climate change are widely documented and demonstrate a pattern of increase in extreme events. For example, a child born in 2024 is expected to experience a significantly higher number of extreme weather events over their lifetime compared to one born in 1970, including three times as many river floods, twice as many tropical cyclones and wildfires, four times as many crop failures, five times as many droughts, and 36 times as many heat waves (Thiery et al., 2021).

Rising average global temperatures intensify the hydrologic cycle, resulting in increased evaporation and precipitation. This could lead to more severe droughts in some regions and torrential rains in others. This global warming affects climate systems in a number of ways, including the melting of polar ice caps and glaciers, contributing to sea level rise. This increases the risk of coastal flooding and habitat loss for human communities and wildlife. The National Aeronautics and Space Administration (NASA) says global sea levels have risen by about 20 centimeters in the last century. The rate in the last two decades of this century, however, is almost double that of the last century and accelerates slightly every year. (NASA, 2019).

The oceans absorb most of the additional heat, which affects the formation of storms and hurricanes. Warming oceans can intensify the strength and frequency of these events, leading to significant destruction of infrastructure and loss of life. According to the US National Oceanic and Atmospheric Administration (NOAA), in the last three years (2021-2023) in the United States there have been 66 extreme weather events, which cost 437.9 billion dollars and resulted in 1690 deaths (NOAA, 2024). Climate change can alter established weather patterns, leading to greater variability and extremity of weather events. For example, heat waves may become more frequent and long-lasting, while extreme cold events may occur more sporadically.

According to the World Meteorological Organization (WMO), 2023 was the hottest year on record in the last 174 years. In addition, the last nine years, from 2015 to 2023, were the warmest in



history (Inmet, 2023). This warming is largely attributed to rising concentrations of greenhouse gases, such as carbon dioxide, methane, and nitrous oxide, which reached record levels in 2022 and continue to grow in 2023 (Inmet, 2023).

The World Meteorological Organization released data, covering the period from 1970 to 2021, in its Atlas of Mortality and Economic Losses from Weather, Climate and Water-Related Hazards. According to the WMO, extreme winds related to weather, climate and water caused almost 12,000 disasters between 1970 and 2021; reported economic losses are \$4.3 billion and increasing; The death toll stands at 2 million, 90% of which are in developing countries, however, it highlights that death rates have fallen thanks to early warnings. (WMO, 2023)

Heat waves are one of the most obvious examples of the impact of climate change. Studies indicate that the number of extreme heat days has increased significantly in recent decades, and is expected to continue to increase (Hoegh-Guldberg et al., 2018). One example is the heatwave that affected the Pacific Northwest and western Canada in 2021, pushing temperatures to levels never before recorded in the region. This extreme event resulted in hundreds of deaths, widespread wildfires, and infrastructure collapses due to the heat. Between June 25 and July 1 alone, 619 extreme heat-related deaths were reported. During this period, Western Canada experienced temperatures up to 20°C above normal, with more than 103 all-time heat records being recorded, including Canada's highest temperature ever measured in Lytton, 49.6°C on June 29, 2021. The entire town of Lytton subsequently burned in a wildfire the next day. (Government of Canada, 2022)

Similarly, floods have become more common and devastating. Heavy rainfall, combined with rising sea levels, result in flooding that affects millions of people globally.

Major storms occurred in September 2023 that began with a typhoon that devastated Hong Kong, followed by a series of extreme weather events in ten countries in just 12 days. Scientists warn that these events could become more common as the climate crisis advances, putting pressure on governments to better prepare. The cost of flooding highlights the urgent need for preparedness, especially in the poorest and most conflict-ridden countries. Hurricane-like storms battered the Mediterranean region, with heavy rainfall in Greece and Turkey causing death and destruction. Libya was badly affected when two dams broke, resulting in a 7-meter wave that devastated the city of Derna. The floods in Libya have been catastrophic, killing more than 11,000 people and leaving thousands missing. The impact has been amplified by poor infrastructure and inadequate warnings, compounded by the climate crisis, making recovery more difficult (Yeung, 2023).

The impacts of extreme weather events are particularly severe on vulnerable communities. Natural disasters result in direct health impacts, such as deaths, injuries, and waterborne illnesses. In addition, prolonged droughts affect food security as they reduce agricultural production and increase food prices (FAO, 2020). The Food and Agriculture Organization of the United Nations (FAO) also



highlights that "extreme weather events are one of the main causes of food crises in many countries" (FAO, 2021). Not only do these events cause immediate destruction, but they also have long-lasting effects, such as the displacement of populations and the degradation of natural ecosystems.

The World Bank warned in a 2018 report that by 2050, climate change will force tens of millions of people to migrate internally in three regions: sub-Saharan Africa, South Asia and Latin America, which account for 55 percent of the population of developing countries. Without concrete action, more than 143 million people, or 2.8% of the population in these regions, could be displaced due to climate impacts. Migrations will occur from areas with less water, lower agricultural productivity, and affected by sea level rise and storms (World Bank, 2018).

Ecosystems also suffer due to extreme weather events. Bushfires, such as those that occurred in Australia in 2019-2020, have destroyed millions of hectares of natural habitat, putting several species at risk of extinction. This 2019–20 bushfire season in Australia was marked by unprecedented wildfires that caused extensive damage to many communities. In a period of severe and prolonged drought, the impact on the natural environment was especially devastating; Scientists have estimated that nearly 3 billion native vertebrates were affected in the forests and woodlands burned during this time. Thirty-three people lost their lives. There have been significant property losses, as well as threats to lives and property that have forced many people to evacuate their homes. Smoke from the fires blanketed parts of Australia, leading to public health recommendations for people to remain in their homes (AIHW, 2020). Not only do these fires alter ecosystems, but they also contribute to soil degradation and reduced air quality.

A significant example of an extreme weather event is Cyclone Idai, which hit Mozambique, Zimbabwe, and Malawi on March 15, 2019. This cyclone was one of the most powerful and devastating ever recorded in the Southern Hemisphere. On the night of March 14-15, 2019, Cyclone Idai made landfall in the city of Beira, Mozambique, resulting in the deaths of more than 1,000 people in Mozambique, Malawi, and Zimbabwe, as well as leaving an estimated 3 million people in urgent need of humanitarian assistance. The catastrophic damage, caused by high winds and extensive flooding, destroyed crops and seed stocks. Millions of people have lost their homes and livelihoods. After one year, more than 8.7 million people still faced a lack of sufficient food or water, and more than 100,000 people in Mozambique remained living in temporary shelters (OXFAM, 2020).

Brazil, in 2023, faced 12 extreme weather events, of which nine were considered unusual and two unprecedented. These events included five heat waves, three heavy rains, one cold snap, one flood, one drought and one extratropical cyclone. Among the most significant events was an unprecedented heatwave that hit the Amazon in July 2023, contributing to one of the worst droughts ever recorded in the region (UN, 2024).



At the end of August 2023, temperatures exceeding 41 °C were recorded in Rio de Janeiro and São Paulo, causing a significant impact on public health and the environment. The resulting drought in the Amazon led to the deaths of more than 150 pink dolphins in Lake Tefé and contributed to a record 22,061 fires in the region in October, the highest number since 2008. Smoke from these fires severely impacted air quality in Manaus (UN, 2024).

Rio Grande do Sul also suffered severely from extreme weather events in 2023. An extratropical cyclone caused heavy rains and strong gusts of wind, resulting in 46 deaths, 46 missing and 340,000 people affected. The subsequent floods caused destruction in several cities, especially in the Taquari Valley region, where 92 municipalities declared a state of public calamity (UN, 2024).

In May 2024, the state was still facing the consequences of heavy rains that caused deaths, disappearances, and a large number of homeless people. Classes were suspended in 2,338 schools in the state network, affecting more than 338 thousand students, with many schools damaged or serving as shelters for the displaced (Lima Neto, 2024). The situation in the state, as of May 18, 2024, included 155 deaths, 94 missing, 806 injured, 77,202 homeless, and more than 2 million people affected in 461 municipalities out of a total of 497 (RS. Gov, 2024)

The global outlook, as indicated by the studies of Poynting & Stallard (2024), suggests that the future will be marked by even more extreme and frequent weather events. Rising global temperatures are directly associated with more intense rainfall, prolonged droughts, and more severe heatwaves, contributing to a vicious cycle of weather events that feed off each other.

To meet the challenges of extreme weather events, it is essential to adopt mitigation and adaptation strategies. Reducing greenhouse gas emissions is key. Transitioning to renewable energy sources, increasing energy efficiency, and adopting sustainable practices are other essential measures to reduce global emissions. Additionally, investing in resilient infrastructure, such as flood-proof buildings and early warning systems, can minimize the impacts of extreme weather events.

According to the United Nations Development Programme (UNDP), climate change adaptation involves actions that aim to reduce vulnerability to the present or future impacts of climate change, such as extreme weather events, sea level rise, biodiversity loss, and food and water insecurity. It highlights that it is essential to develop adaptation policies that help communities adjust to these changes. This includes the creation of land use plans, the management of water resources, and the implementation of resilient agricultural strategies, all of which are key to increasing the resilience of the most vulnerable communities (UNDP, 2024a).

The current trend indicates that extreme weather events will continue to increase in frequency and intensity unless significant action is taken to mitigate climate change. The 2021 IPCC report emphasizes that limiting global warming to 1.5°C is crucial to reducing the risks associated with these extreme events (IPCC, 2021). Preparedness and adaptation of communities and infrastructure



are essential to minimize future impacts. Immediate and coordinated action at the global, regional and local levels is essential to reduce risks and prepare societies to face the challenges that are already manifesting themselves and that are likely to intensify in the future.

Those who will suffer the most from the impacts of climate change, today's young people, are aware of what is happening and becoming increasingly anxious about their future. According to the United Nations Environment Programme (UNEP), eco-anxiety is on the rise, especially among young people. A 2021 global survey of 10,000 young people in 10 countries revealed that more than 50% of them feel sad, anxious, angry, powerless, helpless and guilty about climate change, and 45% said these feelings negatively impact their daily lives. The countries of greatest concern tend to be the poorest, especially in the global south or north, which are directly affected by climate change (Modeer & Otieno, 2022).

This reality imposes significant challenges on education systems, as advocated by Nusche et al. (2024), where it is imperative to prepare new generations to face and mitigate the impacts of climate change. Education for sustainability and disaster management becomes a fundamental part of building a more resilient society prepared for the challenges of the future.

The increasing frequency and intensity of extreme weather events underscore the importance of educating future generations about climate change and its implications. The current climate situation highlights the urgency of effective actions to mitigate the impacts of climate change. Extreme events are not only more frequent, but also more severe, affecting millions of people around the world. The response to this crisis must be comprehensive, involving rapid and unprecedented changes in all aspects of society, as highlighted by the International Panel on Climate Change (UNESCO, 2020). Adapting education systems and preparing for future climate crises are crucial to ensure communities' resilience and long-term environmental sustainability.

Climate change education becomes key to preparing young people to understand and address environmental challenges. Understanding the science behind extreme weather events allows young people to recognize the urgency of the climate crisis and feel empowered to take action. In addition, climate education can inspire action by promoting awareness of the importance of adopting sustainable practices and pushing for public policies that mitigate the effects of climate change. Therefore, the integration of climate education into school curricula is essential to develop a generation that is prepared to face and mitigate environmental impacts, contributing to a more resilient and conscious society.

FUNDAMENTALS OF CLIMATE EDUCATION

Climate education is key to empowering future generations to understand, confront and mitigate the effects of climate change. It is not limited to the mere transmission of information, but



aims to engage students in learning processes that develop critical, civic and problem-solving skills necessary to promote sustainability. As defined by UNESCO, climate education is an educational process that seeks to integrate knowledge about climate change into school curricula, promoting a holistic understanding of the causes, impacts, and solutions to the global climate crisis (UNESCO, 2021a). Its goal is to prepare students to make informed decisions and actively participate in climate change mitigation and adaptation.

In the context of climate change, education emerges not only as a fundamental right, but as an indispensable tool to enable future generations to face imminent environmental challenges. Fletcher (2023) highlights the urgent need to integrate environmental education into schools, stressing that a solid education on climate issues prepares young people to protect vulnerable ecosystems and mitigate the effects of global warming. This need is amplified by the planetary crisis described by UNESCO (2022), which points to climate change, biodiversity loss, and pollution as direct threats to human survival.

Climate Change Education is defined as an educational process that aims to integrate climate change knowledge into school curricula, promoting a holistic understanding of the causes, impacts, and solutions to this global crisis. As Fletcher (2023) and UNESCO (2021a) suggest, EduClima is not limited to the transmission of facts, but engages students in learning that fosters critical, civic, and problematic skills needed to transform society.

The importance of EduClima transcends mere awareness. According to March (2024), it is key to preparing young people to make informed decisions and actively participate in climate change mitigation and adaptation. The evidence is clear: without robust climate education, young people remain vulnerable to the impacts of climate change and less equipped to contribute to a sustainable society.

Several countries have already recognized the importance of EduClima and incorporated it into their education systems. Italy, since 2020/21, has made the topic of climate change and sustainable development mandatory, all schools have started teaching about climate change and sustainable development in at least 33 hours per school year (BBC, 2019). This program aims not only to inform but also to inspire students to become active agents in the fight against climate change. Another example is the Foundation for Environmental Education's "Eco-Schools" program, which operates in 68 countries and reaches millions of students. This program encourages schools to adopt sustainable practices and involve students in environmental action projects (FEE, 2020). The Australian organization Cool Australia, for its part, offers free educational resources on sustainability and climate change for teachers and students, integrating climate topics into various school subjects, with activities, lesson plans, and worksheets to be used in primary or secondary schools (Cool, 2024).



In the Republic of Korea, since 2007, the national curriculum includes climate education at all levels. In preschool, 4-year-olds explore the weather, and at age 5, they learn about weather patterns. This is supported by the Law for the Promotion of Environmental Education, aiming at sustainable development (UNESCO, 2021a). France announced that it would start including lessons on climate change at the start of the 2020/21 school year. In 2020, New Zealand integrated climate change studies into the secondary school curriculum. Cambodia, Argentina, Mexico, and the United Kingdom have also initiated preliminary actions to broaden their curricula by incorporating themes related to climate change (March, 2024).

The UK has taken an ambitious approach through the "Sustainability and Climate Change Strategy" launched in 2022 by the Department for Education (DfE, 2022). This strategy aims to position the UK's education sector as a world leader in sustainability and climate change education by 2030. The strategy ranges from formal education to extracurricular experiences, encompassing the management of school buildings and their surroundings, with the aim of improving the environment and inspiring the local community (DfE, 2023).

These examples highlight the vital role that education systems can play in promoting a deep understanding of sustainability and climate change.

Despite these advances, the integration of climate change education faces significant challenges. As reported by UNESCO (2021b), almost half of the national curricula analysed do not mention climate change, and a minority of teachers feel confident to teach on the topic. This scenario is exacerbated by the direct impacts of climate change on education, such as schools closed due to natural disasters, as highlighted by Venegas Marin et al. (2024) and Nusche et al. (2024).

In response, UNESCO (2024) commits to implementing national education strategies to address climate risk and build more resilient education systems. The World Bank document cited by Venegas Marin et al. (2024) also suggests concrete measures, such as resilience education management and climate-adapted school infrastructure, to protect education systems from climate impacts.

Climate education is based on several fundamental principles and objectives that aim to increase public understanding of climate change and its implications. Among the main foundations are scientific knowledge, awareness and sensitization, practical skills, and empowerment and engagement. Climate education should provide a sound understanding of the scientific underpinnings of climate change, including the causes, effects, and solutions. According to UNESCO, climate education should be based on robust and up-to-date scientific data (UNESCO, 2020). In addition to theoretical knowledge, climate education should equip individuals with practical skills to adopt sustainable behaviors and contribute to climate change mitigation and adaptation.



Climate change education is more than a curricular component; It is an urgent need and a crucial tool for survival and sustainable development. Municipalities and states must urgently implement climate change education, especially in the regions most affected by extreme events, as recently occurred in Rio Grande do Sul and in municipalities such as Teresópolis and Nova Friburgo in Rio de Janeiro, or São Sebastião in São Paulo. It borders on irresponsibility not to discuss the problem with young people in schools, leaving them at the mercy of false information that is not based on scientific knowledge about extreme events.

Curricular changes are essential, as well as intensifying access to websites that explain global warming and climate change from a scientific point of view. Not only nations must get involved, but especially local authorities, where tragedies caused by climate change occur. Municipalities can and should include climate change education in school curricula, train teachers of all subjects to be open to discussing the problem, and encourage young people to take action. Nations must act swiftly and decisively to integrate EduClima into all levels of education, empowering young people to be proactive agents of change in the fight against climate change. As the climate crisis respects no borders, the education response must also be global, with shared policies, resources, and strategies that transcend national borders to prepare a truly resilient and empowered generation.

According to the United Nations Development Programme (UNDP), it is indisputable that education is a fundamental tool. Policymakers must continue to educate all generations not only on what climate change is and its effects but, even more importantly, on protection and mitigation measures. Integrating climate-focused education, from primary to tertiary education, will be essential to create awareness and embed climate solutions at all levels of society. Empowering young people offers a historic, transformational, and collective opportunity to promote an inclusive green recovery, accelerate progress on the SDGs, and lay the foundation for a peaceful and sustainable future (Modéer, & Otieno, 2022)

To address the challenges of implementing climate education, it is necessary to adopt diverse practices and approaches adapted to different educational and cultural contexts. Curriculum integration, for example, is an approach that ensures that all students acquire knowledge about climate change from an early age. UNESCO suggests that integrating climate education into all school subjects is essential to achieve a holistic understanding (UNESCO, 2020). Engaging students in hands-on projects related to climate change can make learning more meaningful and applicable. School gardening projects, air quality monitoring, and waste reduction initiatives are all effective examples.

The phenomenon of climate change has become a global challenge that affects human activities in many ways. Exploring the sustainability and innovation of digital education is an important benchmark for the continued implementation of scientific and educational strategies and



for positive effects on climate change mitigation. Digital tools can facilitate collaborative learning and scientific research. (Zhao et al, 2023). Collaborating with environmental organizations, universities, and local communities can enrich climate education by providing diverse learning experiences and additional resources. Collaboration can include lectures by experts, visits to research centers, and participation in community events.

Beyond the school environment, climate education must extend to the community. Community education programs, workshops, and awareness campaigns can reach a wider and more diverse audience. Young people and children are among the most affected by climate change, not only in terms of physical and emotional health, but also in terms of access to education. March (2024) points out that extreme weather events, such as floods and heatwaves, significantly limit access to education, perpetuating a cycle of vulnerability and poverty. UNICEF points out that billions of children live in countries with high climate risk, many of whom could lose access to education due to climate-induced disasters (March, 2024).

The importance of climate education in preparing young people cannot be underestimated. According to UNESCO (2020), it should be transformative, empowering students to understand climate science, recognize the urgency of the crisis, and take effective action. Climate education not only informs, but also inspires concrete actions, promoting active and conscious citizenship. UNESCO's "Education for Sustainable Development Goals: Learning Objectives" study (2017) highlights that climate education should include theoretical and practical knowledge, critical and civic skills, and attitudes and values that promote sustainability. Integrating these dimensions into teaching prepares students to be leaders and innovators in building a sustainable future.

Climate education not only prepares young people to address environmental challenges but also catalyzes youth activism, which has proven to be a powerful force in the fight against climate change. Young people who are well-informed and educated about climate issues are more likely to be actively involved in social movements and lead initiatives for change. Youth activism, exemplified by figures such as Greta Thunberg and Txai Suruí, demonstrates the significant impact young people can have on public awareness and pressure for effective environmental policies. Movements such as Fridays for Future and the work of Indigenous activists show how climate education can inspire concrete action and global mobilizations. Thus, the link between education and activism is vital, as a strong educational foundation empowers young people to become leaders in the fight for climate justice and environmental sustainability.

Despite advances, the implementation of climate education faces significant challenges. A 2021 UNESCO report revealed that almost half of national curricula do not mention climate change, and many teachers do not feel prepared to teach on the topic (UNESCO, 2021a). Lack of resources, inadequate teacher training, and institutional resistance are common barriers. In addition, extreme



weather events often disrupt education. Schools closed due to natural disasters, such as floods and hurricanes, hinder continuity of learning and exacerbate educational inequalities (UNICEF, 2021). School infrastructure must be adapted to withstand climate impacts, ensuring the safety and continuity of education.

For climate education to be effective, it is essential that governments, educational institutions and communities work together. Public policies should support the inclusion of climate education in curricula, provide continuous training for teachers, and ensure adequate resources. In addition, it is vital to engage students in hands-on projects and climate action initiatives, connecting theoretical learning with actual practice. The United Nations Development Programme (UNDP) supports "adaptation initiatives that improve the resilience of vulnerable communities" (UNDP, 2024).

In short, climate education is a powerful tool to empower young people to tackle the climate crisis. Integrating it into school curricula and overcoming implementation challenges are crucial steps to ensure that future generations are prepared to promote sustainability and resilience in their communities. Implementing effective and adaptive practices in educational and community contexts is essential to prepare future generations to address climate challenges in an informed and proactive manner.

ROLE OF YOUTH ACTIVISM IN THE FIGHT AGAINST CLIMATE CHANGE

Youth activism has emerged as a potent and transformative force in the fight against climate change. Young people around the world have been mobilizing to demand immediate and effective climate action, bringing new perspectives and renewed urgency to the public debate. The role of these young activists is vital, as they not only push for policy change, but also raise awareness and engage communities in climate action. Youth activism has a significant impact on various aspects of the fight against climate change, including global mobilization, narrative shifting, political influence, and innovation in creative solutions.

Youth activism and climate education are intrinsically linked. Young people who are well-informed about climate issues are more likely to become activists. Climate education provides the knowledge needed to understand the science of climate change and the skills to advocate for sustainable policies. Educational programs that incorporate climate action projects encourage students to apply what they learn in the classroom to practical initiatives.

Youth activism against climate change has gained international prominence with Greta Thunberg's initiative. In August 2018, Greta, then 15, started a school strike in front of the Swedish parliament, protesting the government's inaction in the face of the climate crisis. Their individual action quickly turned into the global "Fridays for Future" movement, which mobilized millions of young people in more than 150 countries. The young Swedish activist has become a worldwide



symbol of the fight against climate change. His hard-hitting speech at the United Nations in 2019 and his participation in several international conferences galvanized the youth movement and drew global attention to the climate crisis. She stated, "I want you to act like our house is on fire. Because it is" (Thunberg, 2019). This movement has inspired a new generation of activists, demonstrating the power of individual and collective action. Young people have started to use social media and other digital platforms to organize protests, awareness campaigns and petitions, significantly increasing visibility and pressure on decision-makers.

In addition to Greta Thunberg, other young activists have played crucial roles in the climate fight. Vanessa Nakate, a young activist from Uganda, in 2019, became the first Fridays for Future protester in Uganda, awakening to her personal power and developing an influential political voice, in addition to founding the "Rise Up Movement" movement and has worked tirelessly to highlight the disproportionate impacts of climate change in Africa (Nakate, 2020). Her work has brought global attention to the need for climate justice and support for the most vulnerable communities. How a young Ugandan realized that her community was disproportionately suffering from the consequences of the climate crisis. In addition, she notes that activists from African nations and the global south are not heard in the same way as activists from predominantly white nations. Their mere presence exposes the deep inequalities and racism within the climate justice movement. In January 2020, during her attendance at the World Economic Forum in Davos, Switzerland, as one of five international delegates, the Associated Press cut Nakate out of a photo, which showed the other four activists, all white. This incident highlighted Nakate's ongoing call for environmental and social justice for those who have been excluded from climate discussions and who now demand to be heard (Nakate, 2020).

Another striking example of youth activism is that of Txai Suruí, a young Brazilian indigenous woman who highlighted the importance of environmental protection and indigenous rights in international forums. Txai was the only Brazilian to speak at the opening of the 26th Climate Conference (COP26), in Glasgow, in 2021 (G1, 2021). In her speech, she highlighted the problems faced by indigenous peoples in the Amazon, including illegal mining and the destruction of their lands. An excerpt from Txai's speech at COP26 makes a strong call for action on climate change, saying: "We must listen to the stars, the moon, the wind, the animals and the trees. Today the climate is warming, animals are disappearing, rivers are dying, our crops don't flourish like they used to. The Earth is talking, it tells us that we don't have time anymore" (G1, 2021). Txai emphasized the need for urgent action to curb climate change and the importance of indigenous peoples' participation in climate decisions, given their crucial role in protecting forests (Cruz, 2023).

The movement led by Txai Suruí also reflects an intersection between environmental activism and human rights advocacy. From a very young age, Txai followed her parents' struggle for the



protection of their lands in Rondônia and, in 2020, founded the Rondônia Indigenous Youth Movement, which has more than 1.7 thousand members (Unicef, 2023). Her work highlights the importance of climate justice not only as an environmental issue but also as a human rights issue, emphasizing the need to protect vulnerable communities who are on the frontlines of climate change.

In Uruguay, the Youth Network for Climate Justice is the result of a joint effort between young activists and Acción Clima Joven, with the support of UNICEF. This initiative seeks to support and empower the next generation of climate leaders by expanding and strengthening the representation and influence of young Uruguayans in national climate and environmental policy. The first significant milestone in his mission took place during the national meeting of Uruguay's Ministry of the Environment. At that meeting, the young activists made their first request, requesting a dedicated workspace for the youth network within the National Climate Change Response System (SNRCC). This request was granted, allowing young people a space and a platform to influence climate-related policymaking. As a result of this initiative, in 2022, Uruguay decided to create a space for youth representation within the SNRCC, reinforcing the country's commitment to the inclusion of young people in discussions and decisions on climate change (UNICEF, 2024).

In the United States, on June 1, 2022, 13 young people in Hawaii filed a lawsuit, called *Navahine F. v. Hawaii Department of Transportation*, against the Hawaii Department of Transportation (HDOT) and the state of Hawaii. They allege that the transportation system operated by HDOT generates high levels of greenhouse gas (GHG) emissions, violating their constitutional rights and causing significant harm. These young people claim that these emissions affect their ability to "live healthy lives in Hawaii, now and in the future." They want to ensure that HDOT meets the goal set by the state legislature to decarbonize Hawaii's economy and achieve zero emissions by 2045 (Our Children's Trust, 2024)

Another example of the influence of youth activism is the landmark trial in the state of Montana, in the United States, where young activists sued the state government for failing to consider the impacts of climate change in its decisions about fossil fuels. In August 2023, the court ruled in favor of the youth, highlighting the constitutional right to a healthy environment and setting an important precedent for future legal action. The ruling means that Montana, a major coal and gas-producing state that gets one-third of its energy from burning coal, must consider climate change when deciding whether to approve or renovate fossil fuel projects (Gelles & Baker, 2023).

Most recently, on December 10, 2023, 18 California children, ages 8-17, filed a lawsuit called *Genesis B. v. United States Environmental Protection Agency* against the United States Environmental Protection Agency (EPA) and the United States federal government. These children claim that the EPA allows the emission of potentially fatal climate pollution from the fossil fuel sources it regulates, harming their health and well-being. They also allege that the EPA discriminates



against them by disregarding the economic value of their lives and futures when deciding on the amount of climate pollution allowed (Our Children's Trust, 2024).

Several movements and prominent figures have been instrumental in advancing youth activism against climate change. Started by Greta Thunberg in 2018, Fridays for Future is a global school climate mobilization movement. Millions of students around the world have been taking part in strikes and protests, demanding climate action from their governments. The Fridays for future youth movement has as its central platform the keeping of global temperature rise below 1.5°C above pre-industrial levels, emphasizing the importance of climate justice and equity for all. The move highlights the need to listen to the available science, creating a safe path to keep global warming below this critical threshold. Committed to the principles of the Paris Agreement, Fridays for Future seeks a union based on scientific evidence and advocates for an end to investments in fossil fuels, promoting a transition to more sustainable and equitable energy sources. (Fridays for Future, 2019).

In the United States, the Sunrise Movement is a youth-led movement advocating for a Green New Deal and ambitious policies to combat climate change. They have carried out direct actions, media campaigns, and political lobbying to promote their causes. Founded in 2017, it bills itself as the climate revolution, aiming to force the government to end the era of fossil fuel elites. The movement's platform includes investments in Black, brown, and working-class communities, and the creation of millions of good union jobs. Emphasizing the need to put ordinary people in charge, the Sunrise Movement aims to build a world that works for everyone, now and in the future. Acknowledging the intensification of climate change, the movement denounces the responsibility of fossil fuel executives and politicians for decades of neglect. They emphasize that they are fighting for what science demands. Confronting the situation, they call for the struggle for power to prevent a climate catastrophe, highlighting that if nothing is done, by 2050, billions of people could become displaced, with natural disasters and food crises becoming more and more frequent. The transition to a new world must be led by young people of all races and classes, mobilizing to elect Green New Deal advocates and push for effective climate policies. (Sunrise Movement, 2021).

Founded by young activists, Zero Hour is an international movement that organizes marches, campaigns, and actions to demand climate justice. Created in 2017 in the United States, it seeks to center the voices of diverse young people in the fight for climate and environmental justice. This youth-led movement provides entry points, training, and resources for new activists and organizers, as well as supporting adults who share this vision. Zero Hour's mission is to organize an unstoppable movement of young people who protect the rights of all and ensure a clean, safe, and healthy environment for a prosperous future. The movement's guiding principles emphasize that those on the frontlines of climate change, including the Global South, People of Color, Indigenous Peoples, Youth, People with Disabilities, Poor People, Women, Queer and Trans People, and People of



marginalized faiths, must lead the fight. Youth leadership is considered transformative and visionary, essential to displacing culture from the oppressive systems of capitalism, colonialism, racism, and patriarchy. The movement advocates building an intersectional alliance to achieve collective liberation and pressure elected officials to enact policies that protect the future of the planet (Zero Hour, 2019).

These cases of youth activism demonstrate a growing movement of young people engaged in the fight against climate change and defending their rights to a healthy future. These cases show that young people have a voice and power to influence public policy, promote awareness of climate issues, and highlight the importance of intergenerational justice. The legal victories set precedents that could influence future actions in other states and countries, strengthening the global movement for climate justice and demonstrating that younger generations are becoming active leaders in the fight for a sustainable future.

The impact of youth activism has been significant on several fronts. School strikes and protests organized by movements such as Fridays for future have put pressure on governments and international institutions to recognize the urgency of the climate crisis and take more ambitious action. In response to the demands of young people, the European Union launched the European Green Deal in 2019, a comprehensive plan to make Europe the first carbon-neutral continent by 2050, its implementation of which has decisive support from young people across Europe (European Youth Forum, 2020). In addition to political changes, youth activism has also influenced public opinion. The visibility of the protests and campaigns on traditional and social media has raised awareness of climate change and its implications, encouraging more people to get involved in the cause.

While youth activism has achieved many successes, it also faces significant challenges. Political resistance, lack of resources, and inequality of access are common barriers. Young activists often face resistance from established political and economic institutions that have a vested interest in maintaining the status quo. Not all young people have equal access to resources and platforms to make their voices heard, especially in disadvantaged regions. In addition, climate anxiety and the burden of fighting a global crisis can take a toll on the mental health of young activists. However, these barriers also present opportunities to strengthen the movement.

Investing in climate education and youth empowerment can further increase the impact of youth activism. International collaboration and the exchange of knowledge and strategies are essential to strengthen the movement. Collaborations between youth activists, NGOs, educational institutions, and governments can create powerful synergies to address the climate crisis. Promoting diversity and inclusion within the climate movement can ensure that all voices are heard and that equitable solutions are developed.



The importance of youth engagement in the fight against climate change is crucial for several reasons. Young people have a vital interest in the future of the planet, as they will be the ones who face the worst impacts of climate change. Its long-term perspective encourages bolder and more ambitious action. According to the World Economic Forum (Dajana & Shujat, 2023), young people are becoming agents of change in the face of the enormous challenges of climate change. Their continued dedication and creative strategies are influencing effective actions and raising global awareness. They highlight the gravity of the situation through climate strikes, public demonstrations, awareness campaigns, and artistic expressions. These young people interact with decision-makers, raising public awareness and inspiring governments and communities to take action. Their enthusiasm, commitment and innovative ideas are an inspiration and remind everyone that it is possible to make a difference in the fight against climate change.

UNDP's People's Climate Vote, the largest public opinion survey on climate change, involving 1.2 million people from 50 countries, revealed that nearly 70 per cent of under-18s are most likely to believe that climate change is a global emergency (UNDP & University of Oxford, 2021). Reality has shown that youth bring energy, passion and creativity to the climate movement. They are quick to adopt new technologies and approaches, utilizing them for mobilization and advocacy effectively.

Young people are adept at social media and other digital platforms, which are powerful tools for organizing and amplifying their voices. This allows your messages to reach a global audience quickly and efficiently. The integration of digital technologies in education is an effective tool against climate change. Digital platforms reduce the carbon footprint of traditional methods by decreasing the use of paper and improving distance learning, facilitating the exchange of knowledge. Educating students about water conservation, energy consumption, and sustainability is crucial. To maximize the impact of climate education, it is vital to empower educators in the effective use of digital resources (Alphonso, 2024). Pressure from young activists has forced political and business leaders to reconsider their positions and adopt more sustainable policies. The voice of young people has become an important catalyst for climate action.

In summary, youth activism is a vital force in the global climate response. Young activists like Greta Thunberg, Vanessa Nakate, and Txai Suruí not only push for political change, but also inspire and mobilize their communities. The synergy between climate education and youth activism is crucial to prepare a generation that is empowered and engaged in the struggle for a sustainable future. Through global mobilization, narrative shifting, political influence, and innovation, young people have demonstrated their power and potential to drive meaningful climate action. Supporting and amplifying young people's voices is essential to ensuring a sustainable and just future for all generations.



THE SYNERGY BETWEEN CLIMATE EDUCATION AND YOUTH ACTIVISM

The synergy between climate education and youth activism is one of the most dynamic and impactful aspects in the fight against climate change. When well-informed and educated about environmental issues, young people become more effective agents of change, able to lead initiatives that promote sustainability and push for robust climate policies. Climate education provides young people with the knowledge and skills they need to understand the climate crisis, while youth activism channels this understanding into concrete and meaningful actions. Together, these forces create a virtuous cycle of awareness and action that can significantly influence the global response to climate change.

Climate education provides a solid foundation of scientific knowledge about the causes, effects, and solutions to climate change. By understanding the scientific evidence, young people are empowered to make informed decisions and critique policies and practices that contribute to environmental degradation. According to UNESCO, "quality climate change education can transform the understanding and behaviour of individuals" (UNESCO, 2021c). In addition, climate education develops essential skills such as critical thinking, problem-solving, and effective communication. These skills are crucial for activism, as they allow young people to analyze complex problems, formulate strategies for action, and communicate their messages in a persuasive manner.

Climate education also sensitizes young people about the seriousness of the climate crisis and empowers them to take action. By feeling informed and prepared, young people become more confident to lead movements and campaigns. Through climate education, young people learn about the mechanisms of civic participation and how to influence public policy. This is essential for activism, as it allows young people to engage in democratic processes and push for legislative and regulatory change.

Several projects around the world illustrate the synergy between climate education and youth activism. The "Fridays for Future" project is an example already commented on, where the awareness acquired in schools about climate change has led to the mobilization of millions of young people in school strikes and global protests. This global movement, started by Greta Thunberg, is a clear example of how climate education can fuel youth activism. The education she and her fellow activists received formed the basis of their activism and their demands for robust climate policies (Fridays for Future, 2019). In Germany, the "Schools for Future" program engages students in local climate action, from conducting energy audits in their schools to organizing community events on sustainability. These projects demonstrate how climate education can inspire and empower young people to become active leaders in their communities, driving real and lasting change (Schools for Future, 2024).



In the United States, the Sunrise Movement combines climate education with activism by conducting trainings and workshops to empower young activists. They provide knowledge about climate science, organizing skills, and advocacy strategies, empowering young people to lead campaigns for the Green New Deal and other policy initiatives (Sunrise Movement, 2021). Programs such as "Youth Climate Leaders" and "Eco-Schools" empower young people through climate action training and projects. These programs not only educate students about environmental issues but also engage them in practical initiatives such as recycling campaigns, community gardens, and renewable energy projects, turning learning into concrete action (Youth Climate Leaders, 2020; Eco-Schools, 2023). The Eco-Schools Program is an international example that integrates environmental education into school curricula and encourages students to implement sustainable projects in their schools and communities. Young participants often become environmental activists, utilizing the knowledge and skills gained to lead local initiatives and influence educational and environmental policies (Eco-Schools, 2023).

The integration of climate education and youth activism results in numerous benefits. First, young people educated about climate issues are better prepared to lead and participate in initiatives that promote sustainability. They have the ability to understand the complexities of climate change, identify viable solutions, and mobilize their communities around those solutions. Research conducted by UNESCO (2021c) indicates that students involved in climate education programmes demonstrate a significant increase in environmental knowledge, positive attitudes towards the environment, and greater engagement in climate action. These results underscore the importance of an integrated approach that combines education and activism to maximize impact in the fight against climate change.

Additionally, climate education promotes the development of core competencies such as critical thinking, problem-solving, and collaboration. These attributes are key to effective activism, as they enable young people to develop innovative and effective strategies to address climate challenges. Climate education not only prepares young people to understand the climate crisis, but also motivates them to take action. This process involves several interconnected steps: awareness and understanding, empowerment and capacity building, and action and mobilization. The first step is to inform young people about climate change, its causes, effects, and possible solutions. Deep understanding of the environmental and social impacts of the climate crisis is crucial to awakening a sense of urgency. Once informed, young people need to feel empowered to take action. This involves providing them with the necessary tools and resources so that they can engage in activist activities. Workshops, training, and access to communication platforms are key. With the knowledge and skills in hand, young people are encouraged to participate in concrete actions, such as organizing protests



and media campaigns, participating in political negotiations, and implementing sustainable projects in their communities.

While the synergy between climate education and youth activism offers many benefits, it also presents challenges. Effective implementation of climate education can be hampered by a lack of resources, inadequate teacher training, and institutional resistance. Schools and educational institutions may face political and economic pressures that make it difficult to implement climate education programs. In addition, young activists often face political and social barriers that limit their ability to influence change. The climate crisis can cause significant anxiety and stress among young people, especially those deeply involved in activism. It is important to provide psychological support and resources to help young people cope with these feelings.

To overcome these challenges, it is essential that governments, educational institutions, and civil society organizations collaborate to promote climate education and support youth activism. Public policies that integrate climate education into national curricula, along with continuing education programs for educators, are critical. Promoting diversity and inclusion within the climate movement can ensure that all voices are heard and that equitable solutions are developed. In addition, it is important to provide platforms and resources that enable young activists to share their experiences and strategies, amplifying their impact globally (UNESCO, 2021a). Adopting innovative approaches, such as project-based learning, the use of digital technologies, and curriculum integration, can make climate education more accessible and effective.

The interconnectedness of climate education and youth activism is essential to addressing the climate crisis. Climate education provides the necessary knowledge and skills base, while youth activism transforms this foundation into concrete and meaningful action. Together, these forces can create a powerful and sustainable movement that not only responds to today's climate challenges but also prepares future generations to protect and preserve our planet. The combination of climate education and youth activism represents a powerful approach to tackling the climate crisis. By empowering young people with the necessary knowledge and skills, and by supporting their advocacy initiatives, it is possible to drive meaningful and lasting change towards a more sustainable and resilient future.

FUTURE CHALLENGES AND OPPORTUNITIES

Integrating climate education and youth activism presents significant challenges, but it also offers numerous opportunities to build a more sustainable and resilient future. Understanding these dynamics is crucial to maximizing positive impact and addressing existing barriers. Climate education is vital to empowering future generations to understand and address the effects of climate



change, while youth activism brings energy and urgency to the actions needed to mitigate and adapt to this crisis.

Human activities such as fossil fuel use, deforestation, and unsustainable agriculture contribute to climate change by reducing the availability of nutritious food and clean water, and destroying ecosystems, resulting in malnutrition, poor health, and migration, especially affecting young people. These, who make up the majority of the population in many countries, have growing social and environmental awareness, and can transform society towards a low-carbon and resilient future. The United Nations recognizes the crucial role of young people in the fight against climate change by collaborating with youth organizations to empower and increase their participation in policy decisions on the topic. Formal and informal education on climate change and sustainable lifestyles should be strengthened, promoting sustainable patterns of production and consumption, and supporting young people as environmental advocates in their communities. Partnerships between governments, intergovernmental organizations, NGOs and youth groups are essential for environmental initiatives that build the capacity of young people as future leaders in the climate fight. Additional efforts are needed to prepare young people to take advantage of new green employment opportunities, which not only offer work but also enable young people to contribute directly to climate change mitigation (UNYouth, 2013).

One of the biggest challenges in implementing climate education is the lack of adequate resources. Many schools around the world face financial constraints that make it difficult to purchase educational materials, train teachers, and develop after-school programs focused on sustainability. Lack of institutional support and consistent public policies impedes the effective integration of climate education into school curricula (UNESCO, 2021). This educational inequality is particularly reflected in disadvantaged regions and marginalized communities, which often lack adequate educational resources, limiting the potential of their young people to engage in climate activism.

In addition, institutional resistance is another significant challenge. In some regions, climate issues are politically sensitive, and educators face pressure to avoid controversial topics. Schools and educational institutions may face political and economic pressures that make it difficult to implement climate education programs. Governments and school administrations may prioritize other areas of the curriculum, neglecting environmental education. This resistance can hinder the adoption of comprehensive educational programs that address climate change in a holistic and scientific manner.

Inadequate teacher training is a critical obstacle. Many educators do not feel prepared to teach about climate change, either because of a lack of specific knowledge or a lack of appropriate teaching resources. Without continuous and specialized training, it is difficult to ensure that students receive a high-quality climate education.



Young activists face a range of challenges when trying to influence policy and mobilize their communities. Lack of access to platforms and financial resources limits young people's ability to organize impactful events, campaigns, and other initiatives. In addition, many young activists face social and cultural barriers, including the devaluation of their voices and contributions by adults and authorities. Political repression is another challenge faced by activists in some parts of the world. In certain contexts, protests and other forms of activism are seen as threats to stability and public order, resulting in legal restrictions and, in some cases, reprisals against activists (Gayle, Taylor, & Niranjan, 2023)

Despite these challenges, there are many opportunities to expand and strengthen climate education. One such opportunity is the growing global awareness of the importance of education for sustainable development. International organizations, such as UNESCO and UNDP, have promoted initiatives that encourage the inclusion of climate education in national curricula and offer technical and financial support for its implementation (UNESCO, 2021).

Technology also offers new possibilities for climate education. Online platforms, digital resources, and interactive tools can complement traditional teaching and make learning about climate change more accessible and engaging. Programs such as "NASA Climate Kids" provide high-quality educational resources that can be used by teachers and students around the world (NASA, 2024).

Youth activism is also filled with opportunities for growth and impact. Collaboration between youth organizations and environmental NGOs can amplify the voice of young people and provide the resources needed for their campaigns. Additionally, the intersection of activism and technology allows young people to reach global audiences through social media and other digital platforms, increasing the visibility of their causes (Youth Climate Leaders, 2024). Schools and universities can also play a crucial role in supporting youth activism. Educational institutions can provide safe spaces for discussions, capacity-building workshops, and awareness-raising events, as well as encourage student participation in community projects and climate action initiatives. Integrating environmental clubs and student councils focused on sustainability can foster a culture of activism within educational institutions.

To overcome challenges and seize opportunities, various strategies can be implemented. Developing and implementing public policies that encourage climate education and protect the rights of young activists is essential. This includes allocating financial resources to schools and educational programs, as well as creating safe legal environments for activism. Investing in continuing education programs for educators, enabling them to teach about climate change effectively, is equally important. Workshops, online courses, and certification programs can help teachers gain the necessary knowledge and skills.



Establishing partnerships between governments, NGOs, educational institutions, and youth organizations to promote joint climate education and activism initiatives can provide resources, visibility, and logistical support for impact projects. Harnessing digital technologies to disseminate knowledge about climate change and support activism initiatives is another effective strategy. Online platforms, educational apps, and social media can be powerful tools for engaging and mobilizing young people. According to Alphonso (2024), to maximize the impact of climate education, it is vital to train educators in the effective use of digital resources.

Encouraging the active participation of local communities in climate education and activism projects is also crucial. This can include organizing community events, volunteer programs, and awareness campaigns that involve citizens of all ages. Another problem that occurs among young people is climate anxiety. According to research reported by Novotney (2023), conducted by the American Psychological Association in 2020, it identified that almost half of young adults aged 18 to 34 said they felt stress due to climate change in their daily lives. According to the author, the feeling of climate anxiety occurs with a sense of fear, sadness, and dread in the face of global warming or anxiety and worry related to climate change and its effects (Novotney, 2023).

Creating supportive communities among young activists can provide an environment of solidarity and encouragement, helping them navigate the emotional challenges associated with climate activism. Implementing psychological support and well-being programmes in schools and communities can help young people cope with climate anxiety by strengthening their resilience and capacity for action.

The challenges and opportunities in the interconnection between climate education and youth activism are numerous and complex. Overcoming the challenges requires a coordinated and collaborative effort between governments, educational institutions, non-governmental organizations, and communities. Seizing opportunities involves innovation, strategic partnerships, and strong support for the mental health of young activists. Together, these efforts can strengthen young people's ability to lead the fight against climate change, promoting a more sustainable and equitable future for all.

In conclusion, climate education and youth activism are crucial components in the global response to climate change. While there are significant challenges, the opportunities to promote effective climate education and support youth activism are vast. With the right strategies and collaboration between diverse stakeholders, it is possible to build a strong and cohesive movement that empowers future generations to tackle the climate crisis with knowledge, resilience, and determination.



CONCLUSION

The climate crisis represents one of the most urgent challenges of our time, requiring a multifaceted approach that involves education, youth activism, and effective public policy. The synergy between climate education and youth activism forms a powerful combination to address this crisis, empowering future generations to understand, mitigate, and adapt to the impacts of climate change. Climate education is key to providing young people with the knowledge and skills they need to become agents of change. Robust educational programs that integrate climate science into school curricula are essential to prepare students for the environmental challenges of the future. Continuous teacher training and the availability of high-quality educational resources are also essential for the success of these initiatives.

In parallel, youth activism has proven to be a significant force in promoting political and social change. Young activists, such as Greta Thunberg, Vanessa Nakate and Txai Suruí, have mobilized millions of people around the world, pressuring governments and institutions to adopt more ambitious climate policies. Global movements such as Fridays for Future and Sunrise Movement demonstrate how climate education can fuel youth activism, inspiring millions of young people to demand policy change and adopt sustainable practices. These examples highlight the power of youth narratives in influencing public opinion and pushing for more ambitious climate action.

However, effectively implementing climate education and supporting youth activism face several challenges. Inequality of access to quality climate education is a critical problem, especially in disadvantaged regions and marginalized communities that often lack adequate educational resources. The lack of financial and material resources in schools impedes the acquisition of educational materials, the training of teachers, and the development of extracurricular programs aimed at sustainability. In addition, institutional resistance and political and social barriers constitute significant obstacles. In some regions, climate issues are politically sensitive, and educators face pressure to avoid controversial topics. Political repression is also a challenge faced by activists in some parts of the world, where protests and other forms of activism are seen as threats to stability and public order, resulting in legal restrictions and, in some cases, reprisals against activists.

One of the problems that must be considered is inadequate teacher training, constituting a critical obstacle in climate education. Many educators do not feel prepared to teach about climate change, either because of a lack of specific knowledge or a lack of appropriate teaching resources. Without continuous and specialized training, it is difficult to ensure that students receive a high-quality climate education. Additionally, the climate crisis can cause significant anxiety and stress among young people, especially those deeply involved in activism.

Despite these challenges, the opportunities to expand and strengthen climate education are significant. Growing global awareness of the importance of sustainability, combined with the power



of digital technologies and community support networks, provides fertile ground for high-impact initiatives. International organizations, such as UNESCO and UNDP, have promoted initiatives that encourage the inclusion of climate education in national curricula and offer technical and financial support for its implementation. Technology offers new possibilities for climate education. Online platforms, digital resources, and interactive tools can complement traditional teaching and make learning about climate change more accessible and engaging. Free online programs provide high-quality educational resources that can be utilized by teachers and students around the world.

Youth activism is also filled with opportunities for growth and impact. Collaboration between youth organizations and environmental NGOs can amplify the voice of young people and provide the necessary resources for their campaigns. The intersection of activism and technology allows young people to reach global audiences through social media and other digital platforms, increasing the visibility of their movement. Schools and universities can play a key role in supporting youth activism by providing safe spaces for discussions, capacity-building workshops, and awareness-raising events, as well as encouraging student participation in community projects and climate action initiatives. The integration of environmental NGOs and student councils focused on sustainability can foster a culture of activism within educational institutions.

To overcome challenges and seize opportunities, various strategies can be implemented. Developing and implementing public policies that encourage climate education and protect the rights of young activists is essential. This includes allocating financial resources to schools and educational programs, as well as creating safe environments for activism. Investing in continuing education programs for educators, enabling them to teach about climate change effectively, is equally important. Workshops, online courses, and training programs can help teachers gain the necessary knowledge and skills.

Establishing partnerships between governments, NGOs, educational institutions, and youth organizations to promote joint climate education and activism initiatives can provide resources, visibility, and logistical support for impact projects. Harnessing digital technologies to disseminate knowledge about climate change and support activism initiatives is another effective strategy. Online platforms, educational apps, and social media can be powerful tools for engaging and mobilizing young people. Encouraging the active participation of local communities in climate education and activism projects is also crucial. This can include organizing community events, volunteer programs, and awareness campaigns that involve citizens of all ages. Creating supportive communities among young activists can provide an environment of solidarity and encouragement, helping them navigate the emotional challenges associated with climate activism.

In conclusion, the interconnection between climate education and youth activism not only responds to today's climate challenges, but also prepares future generations to protect and preserve



the planet. Climate education and youth activism are essential components in the fight against climate change. Together, they can build a more sustainable and resilient future, ensuring that the next generations are well-prepared to address environmental challenges and promote a fairer and more balanced world. With the right strategies and collaboration between diverse stakeholders, it is possible to build a strong and cohesive movement that empowers future generations to tackle the climate crisis with knowledge, resilience, and determination.



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