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Gender Equity in Higher Education: A Survey of Social Determinants among Rural Girls

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Abstract

Access to higher education is an important factor in promoting gender equity and social development. However, rural girls often face multiple social barriers that limit their opportunities for pursuing higher education. The present study examines the social determinants affecting access to higher education among rural girls. Using a survey method, data were collected from rural female students through a structured questionnaire. The study focuses on key social determinants such as family support, socio-economic status, cultural norms, parental education and availability of educational resources.The findings indicate that socio-economic constraints, traditional gender roles, limited awareness about higher education opportunities and inadequate educational facilities significantly influence rural girls' participation in higher education. Family attitudes and community perceptions also play a crucial role in shaping educational aspirations and access. The study highlights the need for targeted policies and supportive interventions to reduce gender disparities and improve access to higher education for rural girls. Strengthening awareness, improving infrastructure and encouraging family and community support can contribute to greater gender equity in higher education. The results of the study may assist policymakers, educators and researchers in developing strategies to promote inclusive and equitable educational opportunities for rural girls

Keywords: Gender Equity, Higher Education, Rural Girls, Social Determinants, Educational Access, Gender Disparity

Introduction

Education is widely recognized as a powerful instrument for social transformation and empowerment. Access to higher education, in particular, plays a crucial role in enhancing individual capabilities, improving employment opportunities, and promoting social mobility. In recent years, the global emphasis on gender equity in education has increased, as reflected in initiatives such as the United Nations Sustainable Development Goals, which emphasize inclusive and equitable quality education for all. Despite these efforts, significant gender disparities continue to exist in access to higher education, especially among girls belonging to rural communities.Rural girls often face multiple social and structural barriers that limit their participation in higher education. Factors such as socio-economic status, parental education, cultural norms, early marriage, and lack of educational infrastructure can significantly influence their educational aspirations and opportunities. In many rural settings, traditional gender roles prioritize domestic responsibilities for girls, which often results in limited support for their continued education beyond the secondary level. Consequently, many capable rural girls are unable to pursue higher education due to these prevailing social determinants.Furthermore, the availability of higher educational institutions, transportation facilities, and financial resources also affects the educational participation of rural girls. Limited

awareness about career opportunities and societal expectations regarding gender roles may further restrict their access to higher education. These challenges highlight the need to examine the social determinants that influence rural girls' participation in higher education in order to develop effective strategies for promoting gender equity.In this context, the present study aims to explore the social determinants affecting access to higher education among rural girls through a survey approach. By identifying the key factors that influence their educational opportunities, the study seeks to contribute to a better understanding of the barriers faced by rural girls and to provide insights for policymakers, educators, and stakeholders working toward achieving gender equity in higher education.

Different committees and commissions have accepted that education is the most important ingredient in the empowerment process. Although the government has undertaken many programs for the development of rural girls' education and in spite of the equality of status guaranteed under the Indian constitution, double standards prevail in every sector of society, education and social development. Moreover. The social isolation of women contributes to the deterioration of their condition (Mukhopadhayay,2008). Not all educational programmes are equally beneficial. A review of the literature reveals a high rate of failures of conventional educational programmes both formal and non-formals for rural girls. Starting from the sergeant plan of I944, many efforts are taken by the government and other statutory organizations like UGC and NCERT to promote female literacy. Article 45 of the constitution emphasizes compulsory universal education. Sarva Shiksha Abhiyan is an effort to universalize elementary education by community ownership of the school system (MHRD, 2005). Programmes in India such as the Adult Education programme (NAEP), National Literacy Mission, Sarva Shiksha Abhiyan (SSA), Saakshar Bharat Mission. Right to Education Act (2009) and Functional Literacy for children and girls. There are considerable gaps continue to exist between the theory and practice of basic education for the girls. Not all education programs are equally beneficial. A review of the literature reveals a high rate of failure of conventional educational programs, both formal and non-formal, for rural girls. A number of factors contribute to this failure.

The National Policy on Education (NPE, 1986) as revised in 1992 was landmark in the field of policy on girl's education in that it recognized the need to redress traditional gender imbalances in educational access and achievement. The NPE also recognized that enhancing infrastructure alone will not redress the problem. It recognized that "the empowerment of women is possibly the most critical pre-condition for the participation circumstances including open schooling and ensures that no child is deprived of secondary education of satisfactory quality due to gender, socio-economic, disability and other barriers.

Statement of the Problem

Gender Equity in Higher Education: A Survey of Social Determinants among Rural Girls

OBJECTIVES OF THE STUDY

1. To study the social determinants influencing access to higher education among rural girls.

2. To suggest policy implications and recommendations based on the findings of the study.

NEED AND SIGNIFICANCE OF THE STUDY

In recent years, India has made significant progress in expanding access to education, including higher education for women. According to the All India Survey on Higher Education (AISHE), female enrolment in higher education has increased considerably, reaching about 2.07 crore students and constituting nearly 48% of the total enrolment in 2021–22. This indicates an improvement in gender participation in higher education. However, despite this progress, disparities in access to higher education still persist, particularly among girls belonging to rural areas. Empirical studies and national educational data suggest that social factors such as socio-economic status, parental education, cultural norms, and availability of educational infrastructure significantly influence rural girls' participation in higher education. Although female participation in schooling has improved—with girls constituting about 48–50% of enrolment at the secondary and higher secondary levels—many girls still face difficulties in transitioning to higher education due to financial constraints, social expectations and limited institutional facilities in rural regions.

Furthermore, research indicates that socio-cultural barriers such as early marriage, domestic responsibilities, safety concerns, and lack of awareness about higher education opportunities continue to hinder rural girls' educational advancement. These challenges highlight the need for empirical investigation into the social determinants that influence rural girls' access to higher education.Therefore, the present study is important to examine the social determinants affecting access to higher education among rural girls through a survey approach and to provide evidence-based suggestions and policy implications for improving gender equity in higher education.

Operational Definitions of Key Terms

- **Gender Equity**

Gender equity refers to fairness and equal opportunities for girls and boys in accessing and benefiting from higher education without discrimination based on gender.

- **Higher Education**

Higher education refers to education provided at colleges, universities, and other institutions after completion of secondary education.

- **Rural Girls**

Rural girls refer to female students residing in rural areas or villages who are eligible for or pursuing higher education.

- **Social Determinants**

Social determinants refer to social, cultural, and economic factors such as family background, parental education, socio-economic status, cultural norms, and community attitudes that influence access to higher education.

- **Access to Higher Education**

Access to higher education refers to the opportunity and ability of rural girls to enroll in and continue studies at colleges or universities.

Sr No.	Social Determinant	Indicator	% of Rural Girls
1	Socio- economic Status SES	Girls from low income households attending school	68-72
2	Parental Education	Girls at least with one literate parent	78
3	Gender Attitude	Parents supporting girls education up to Graduation Level	75-78
4	School Access	Girls with access to Primary Education in the village	95
5	School Access	Girls with access to Secondary Education in the village	70
6	Digital Access	Girls with access to smart phones	85-90
7	Digital Access	Girls with digital learning Skills	55-60
6	Safety and Mobility	Parents allowing girls to travel alone to school	63
7	Infrastructure	School with functional girls' toilets	70-75
8	Retention	Girls continuing to Secondary level	65-70
9	Academic Performance	Girls passingSecondary Exams	94-96

Sample

A representative sample of 120 girls living in Moga district were selected for the study. The sample comprised girls selected from all the sections of the community of the village like scheduled caste, backward caste and upper class in equal proportion. The sample was selected on the basis of proportionate sampling technique.

Tool Used

An interview schedule constructed by the investigator is used to get information about the social determinants such as socio economic status, size of the family etc.The study is confined to 120 rural girls selected from Moga district of Punjab state

Data, their presentation, Analysis and Interpretation

The component-wise distribution of items on scale is presented in the following table:

Table: Rural Girls' Education in Punjab across Social Determinants

The data on rural girls' education in Punjab reveal a complex interaction of multiple social determinants that influence both access and outcomes. While access to primary education has reached near universality (around 95%), largely due to government initiatives and improved infrastructure, disparities become more visible at higher levels of education. Only about 65–70% of rural girls continue to the secondary stage, indicating that retention remains a significant concern. Socio-economic status continues to play a crucial role, as girls from low-income households face constraints related to educational expenses, domestic responsibilities and opportunity costs. Parental education emerges as a strong enabling factor, with nearly 78% of girls having at least one literate parent, which positively influences enrolment and aspirations. Encouragingly, around 75–78% of parents now support girls' education up to graduation, reflecting a gradual shift in gender attitudes. However, deep-rooted socio-cultural norms still affect educational trajectories. Safety and mobility concerns restrict independent movement for nearly 35–40% of girls, limiting their access to distant secondary schools

Similarly, although digital access appears high (85–90%), it is often shared and mediated, resulting in only 55–60% of girls possessing functional digital learning skills. This highlights a persistent gender gap in digital empowerment. Infrastructure improvements, such as availability of girls' toilets (around 72–75%), have contributed positively to attendance, yet gaps remain in rural settings. Interestingly, academic performance among girls is notably high, with pass percentages exceeding 94%, indicating that those who remain in the system perform well. Overall, the findings suggest that while structural access barriers are gradually diminishing, social and cultural determinants continue to shape participation and progression. Addressing these requires a multidimensional approach focusing on economic support, gender sensitization, digital inclusion, and safe educational environments.

Key Findings

1. The study reveals that access to primary education for rural girls in Punjab has reached near-universal levels, reflecting effective implementation of educational policies.

2. Despite high enrolment at the primary level, a significant proportion of rural girls do not continue to the secondary stage, indicating persistent dropout issues.

3. Socio-economic status remains a critical determinant, as girls from low-income families face greater barriers in continuing their education.

4. Parental education has a positive influence on girls' schooling, with educated parents more likely to support higher education.

5. A majority of parents demonstrate favorable attitudes toward girls' education, with nearly three-fourths supporting education up to the graduation level.

6. However, traditional gender norms and cultural expectations continue to restrict girls' educational progression in rural areas.

7. Safety and mobility concerns significantly limit girls' access to schools, especially at the secondary and higher levels.

8. Although access to digital devices is relatively high, it is often shared within households, limiting girls' independent use for educational purposes.

9. A noticeable gap exists in digital skills among rural girls, highlighting inequalities in effective utilization of technology.

10. Improvements in school infrastructure, particularly the availability of girls' toilets, have positively influenced attendance and participation.

11. Rural girls demonstrate high academic performance, often outperforming boys in board examinations

12. Despite better academic outcomes, girls' retention in the education system remains comparatively lower, indicating a performance–participation gap.

13. The focus of education in Punjab is gradually shifting from mere access to quality, skill development, and empowerment.

14. Overall, the findings suggest that social determinants such as economic status, gender norms, parental education, and infrastructure continue to play a decisive role in shaping educational opportunities for rural girls.

Educational Implications

1. Need to shift focus from enrolment to retention and completion

2. Importance of gender-sensitive school environments

3. Integration of digital literacy programs specifically for girls

4. Strengthening career guidance and counseling services in rural schools

5. Promoting parental awareness programs to sustain positive attitudes

6. Emphasizing life skills and empowerment-based education

7. Enhancing teacher training to address gender and socio-cultural issues

Recommendations

Policy Level

- Provide financial incentives/scholarships for rural girls at secondary and higher levels
- Improve transport facilities and safe commuting options
- Ensure full infrastructure coverage (toilets, boundary walls, lighting)

School Level

- Introduce mentorship programs for girls
- Organize gender sensitization workshops
- Strengthen digital learning with individual access for girls

Community Level

- Conduct awareness campaigns to challenge gender stereotypes
- Encourage community participation and support groups (SHGs)
- Promote role models of educated rural women

Research Level

- Further studies on intersection of gender, technology, and rural education
- Longitudinal research on dropout causes among rural girls
- Comparative studies across districts of Punjab

Conclusion

The study highlights that rural girls' education in Punjab has made significant progress in terms of access and enrolment, particularly at the primary level. However, the transition to and retention in secondary education remain critical challenges. While parental attitudes toward girls' education are becoming increasingly positive, socio-economic constraints, gender norms, and safety concerns continue to influence educational participation. The findings also reveal a notable paradox: despite high academic performance among girls, their educational continuity is hindered by structural and cultural barriers. Furthermore, the digital divide, though narrowing in terms of access, persists in terms of usage and skill development. Overall, the study underscores that educational advancement for rural girls is not solely an issue of availability but is deeply rooted in broader social determinants that shape opportunities and outcomes.

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Youth Engagement and Leadership in Climate Action: A Humanistic Approach to Education for Climate Resilience (The Case of Green Agro Solution, Ethiopia)

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1. Introduction

Climate change is not merely an environmental issue; it is a profound challenge that intertwines with social, economic, and political factors across the globe. In Ethiopia, where agriculture remains the bedrock of the economy, the effects of climate change are increasingly severe. Farmers face erratic weather patterns, prolonged droughts, and rising temperatures that significantly threaten food security and rural livelihoods.

Climate action must focus on empowering youth, who represent a considerable demographic within Ethiopia. Engaging young people in sustainable practices can stimulate intergenerational change, fostering a collective movement toward climate resilience. This article explores the strategies employed by Green Agro Solution and highlights the intersection of youth leadership with the UN Sustainable Development Goals, focusing on Goals 4 and 13. Goal 4 advocates for Quality Education, while Goal 13 champions Climate Action.

2. Climate Change in Ethiopia

2.1 Context of Vulnerability

Ethiopia is classified as one of the most climate-vulnerable countries in the world, with a heavy reliance on rain-fed agriculture. According to the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (2021), the country is experiencing increasing variability in rainfall and rising temperatures, leading to adverse impacts on agricultural productivity. The 2011 Ethiopian Climate Resilient Green Economy Strategy emphasizes the urgent need for transformative changes in practices and policies to mitigate these impacts.

In 2021, the Ethiopian National Adaptation Programme identified key priorities, including improved water management, agro-ecological practices, and community-based approaches to adapt to climate variability. However, these efforts depend significantly on engaging youth who are both the most affected demographic and critical stakeholders in the fight against climate change.

2.2 The Case for Youth Engagement in Climate Action

Youth engagement is crucial in addressing climate challenges for several reasons:

- **Demographic Impact**: Nearly 70% of Ethiopia's population is under the age of 30, positioning youth as influencing actors in advocating for sustainable practices.

Adaptability to Innovation: Young people are often more adept at adopting new technologies and methodologies, facilitating the transition to sustainable practices.

Intergenerational Knowledge Transfer: By fostering intergenerational dialogue, youth can bridge gaps between traditional knowledge and modern agricultural innovations.

Peer Mobilization: Youth have a unique ability to galvanize their peers, amplifying messages of sustainability and resilience within their communities.

Engaging youth actively can lead to the creation of a shared vision for climate resilience, thereby strengthening community bonds and fostering collective agency.

3. The Role of Education in Climate Action

3.1 UN Sustainable Development Goals Overview

The United Nations Sustainable Development Goals (SDGs) outline a global agenda to achieve a better and more sustainable future for all by 2030. Two critical goals within this framework directly pertain to the themes of this article:

- **Goal 4: Quality Education**: Ensures inclusive and equitable quality education and promotes lifelong learning opportunities for all.
- **Goal 13: Climate Action**: Urges urgent action to combat climate change and its impacts.

Both goals are interconnected—the absence of quality education stymies progress in climate action, while effective climate education enhances resilience and empowers communities to adapt to changing conditions.

3.2 Empirical Data on SDG Goals

According to UNESCO, as of 2020, approximately 258 million children and youth are out of school globally, with millions more attending poor-quality schools. In Ethiopia, where educational reforms are underway, challenges remain, particularly with access to quality education in rural areas. The UN reports indicate that:

- **Enrollment Rates**: The primary school net enrollment rate was around 82% in 2019, yet disparities exist based on rural-urban divides and gender.
- **Quality of Education**: A significant portion of the youth population lacks essential skills, with UNDP suggesting that more than 70% of graduates are unable to find jobs due to inadequate preparation.

In terms of climate action:

- **Community Resilience**: Studies reveal that educating communities about climate-smart agricultural practices can increase resilience, with successful case studies demonstrating gains in productivity and environmental sustainability.
- **Youth-Driven Initiatives**: Programs that involve youth in decision-making processes regarding climate strategies

are shown to enhance both engagement and outcomes.

3.3 Linking Education to Climate Action

Integrating climate education into school curricula is paramount for fostering an informed youth that can advocate for climate resilience. Education must not solely focus on scientific understanding, but also encompass ethical dimensions, critical thinking, and local knowledge. By bridging traditional practices with modern techniques, educators can cultivate a new generation of farmers prepared to face future challenges.

4. Green Agro Solution (GAS): A Model for Empowering Youth

4.1 Overview of Green Agro Solution

Green Agro Solution (GAS) is an Ethiopian organization established in 2014, dedicated to empowering smallholder farmers through a comprehensive digital platform. Focused on leveraging opportunities within the agricultural sector, GAS aims to enhance productivity and resilience among youth farmers by providing tailored advisory services and resources related to climate-smart agriculture. Central to its operations is the Lersha platform, which integrates various data services into a single application, addressing challenges faced by farmers. This one-stop digital solution enables smallholder farmers to invest wisely, manage risks, and respond effectively to agricultural shocks, all under the motto “Making Agriculture Easy for Everyone.”

By employing diverse models, GAS benefits multiple stakeholders across the agricultural value chain. The organization targets farmers, youth agents, and service providers, working to improve the interconnectedness of agricultural systems. Through partnerships with farmer-based organizations and Micro, Small, and Medium Enterprises (MSMEs), GAS seeks to capitalize on local, national, regional, and global market opportunities. MSMEs play a vital role in job creation and economic growth, especially for women, youth, and vulnerable populations.

Active in six Ethiopian regions—Amhara, Oromia, Central Ethiopia, Sidama, Tigray, and the Somali region—GAS collaborates with over 64 agro-dealers, 174 mechanization service providers, and more than 1,100 smallholder farmers. Additionally, it has enlisted over 1,470 digitally enabled youth, known as Lersha agents, to support farmers across both highland and lowland areas.

With a team of more than 127 full-time staff members, including 45% women and 90% under 30, GAS emphasizes gender diversity and youth engagement. Recent assessments underscore its commitment to building a gender-transformative approach in agritech, aiming to create flexible training and employment opportunities, particularly for young women.

The Lersha platform operates within a contextualized framework, providing value to smallholder farmers while contributing to broader resilience-building efforts. Key activities include deploying digital tools, offering agro-climatic advisory services,

facilitating mechanization, and bundling agricultural services with financial support. By enhancing market efficiency and productivity through data-driven insights, GAS has positively impacted over 220,000 farmers. The organization continues to expand its digital solutions, including five platforms designed to improve agricultural service provision, market linkage, and access to finance, ultimately transforming Ethiopia's agricultural landscape.

4.2 Features of the Lersha Platform

Lersha includes several innovative features aimed at maximizing youth engagement and promoting sustainable agricultural practices:

- **Mobile Application**: The user-friendly interface provides critical agricultural information, including weather forecasts, pest management advice, and farming techniques.
- **Localized Content Delivery**: Information is disseminated in local languages, making it more accessible to younger farmers who might be illiterate.
- **Community Networks**: Local agents facilitate trust and credibility, enhancing the dissemination of knowledge and resources.

4.3 Competencies of GAS on Youth engagement and Leadership in creating Climate resilient agriculture

Our robust experience in deploying digital solutions, strengthening community-led initiatives, and building resilient agricultural systems makes us an ideal partner to contribute to Ethiopia's agricultural transformation. These strengths collectively position us as a reliable and capable partner for ATI's transformative agricultural initiatives. Below are the key technical qualifications, competencies, and relevant experiences of GAS:

1. Youth Network: Creating Opportunities and Empowering Communities

The Lersha Youth Network is integral to Lersha's mission, aiming to foster economic growth and social transformation in rural communities. By creating sustainable employment opportunities, Lersha empowers its agents to improve their livelihoods while contributing to community development. The network focuses on recruiting motivated, agriculture-educated youth passionate about advancing the agricultural sector and supporting local farmers. Acting as vital intermediaries, these agents help bridge the gap between technology and farmers, many of whom are unfamiliar with digital tools.

Lersha's recruitment process targets unemployed youth from rural areas, collaborating with regional job creation offices and the Ministry of Agriculture. Selected candidates undergo comprehensive training in areas such as climate change strategies, the use of the Lersha digital platform, agronomy, livestock management, and business development services. This training equips agents not only to facilitate digital transactions but also to assist farmers in optimizing practices.

The expansion of the Lersha Youth Network has generated significant job opportunities

for rural youth, with agents earning commissions for their services, thereby fostering a culture of entrepreneurship. To promote digital financial services, Lersha offers training that enhances financial literacy, particularly focusing on mobile wallets and microcredits.

Recognizing the gender gap in representation, Lersha implements initiatives to encourage female participation. Women call center agents lead workshops to empower more women to join the network. By bridging the digital divide and supporting sustainable agricultural practices, the Lersha Youth Network enhances the economic and social fabric of rural communities, contributing to a more equitable future for all.

2. Creating Jobs for Youth through Financial Literacy and Digital Empowerment Initiatives

Green Agro Solution (GAS) has provided financial literacy training to over 1,400 smallholder farmers and 200 Lersha agents across 44 Woredas in Oromia and Southern Ethiopia. This program empowers participants, especially youth, with essential knowledge on accessing financial services such as loans and micro-insurance, crucial for building sustainable livelihoods. By dispelling misconceptions about Tax Identification Numbers (TINs) and tax responsibilities, GAS encourages confidence in financial systems, fostering greater trust among participants.

These training efforts significantly benefit youth Lersha agents, who gain the skills to become micro-entrepreneurs, thus playing vital roles in their communities' economic development. GAS creates pathways for youth to secure meaningful employment within the agricultural value chain.

In addition to training, GAS promotes awareness and adoption of digital agricultural solutions through youth and women agents. Equipped with digital tools and resources, these agents can better serve farmers and enhance their own professional opportunities.

To maximize impact, GAS utilizes engaging social media, strategic outreach campaigns, and insights from its call center, providing tailored support to youth agents and fostering sustainable growth. Gender-inclusive initiatives also promote the active participation of young women, ensuring equitable job creation within the community.

3. Empowering Youth and Driving Job Creation through Market Output Aggregation and Financial Innovation

Green Agro Solution (GAS) is leveraging market output aggregation as a pathway to create jobs for youth and improve access to finance for rural communities, including young and women farmers. By strengthening farmer organizations, anchor firms, and third-party warehouse service providers, GAS has established aggregation centers linked to a warehouse receipt system and Digital Market Linkage Platform (DMLP). This initiative promotes financial inclusion and job creation by connecting smallholder farmers to markets while offering collateral-based financial access.

In addition, GAS is piloting innovative financial solutions in the Sidama and Oromia regions in partnership with Sinquee Bank, Hibret Bank and Dashen Bank. A digital credit scoring model tailored to smallholder farming needs, including inputs, labor, and climate resilience, is a cornerstone of this initiative. The model emphasizes financial responsibility and loan repayment while creating job opportunities for young people as agents supporting the system. Through this program, GAS facilitated $300,000 in loans for 600 farmers and plans to scale up to reach over 2,000 farmers in the pilot phase. Youth are key beneficiaries of this initiative, as the program develops pathways for financial literacy, employment, and active participation in agricultural innovation.

5. Facilitating Youth Empowerment through Agriculture from GAS perspective

5.1 Climate-Smart Agriculture

Lersha promotes climate-smart agricultural practices designed to optimize productivity while minimizing environmental impact. Core strategies include:

- **Resource Management**: Encouraging efficient use of water and soil resources to support high-yield farming while conserving natural ecosystems.
- **Crop Diversification**: Promoting the cultivation of varied crop species to enhance resilience against climate-related risks.

5.2 Educational Initiatives

Lersha organizes hands-on training sessions focused on sustainable practices. These sessions cover crucial topics, including soil health management, pest control, and efficient irrigation practices.

Recognizing the importance of technology, Lersha invests in digital literacy training. Young farmers learn to use the application effectively, access agricultural data, and communicate with peers and experts.

5.3 Access to Resources

Lersha facilitates access to essential resources, spanning from financial services to agricultural inputs:

- **Microloans**: Partnerships with local financial institutions provide youth with necessary funding to invest in sustainable agricultural practices.
- **Inputs Distribution**: Collaborations with local suppliers ensure that youth have access to quality seeds and fertilizers, crucial for enhancing productivity.

6. Youth Leadership in Climate Action

6.1 Building Leadership Skills

Lersha emphasizes the need for developing leadership qualities among youth, providing foundational training that incorporates:

- **Communication Skills**: Training in effective messaging enhances the ability of youths to advocate for sustainable practices. This includes public speaking, persuasive writing, and digital communication,

equipping them to convey their ideas clearly and confidently.

- **Conflict Resolution**: Teaching negotiation techniques enables young leaders to manage disputes and facilitate collaboration within their communities. They learn to approach conflicts with empathy, identify underlying issues, and foster a culture of mutual respect.
- **Teamwork and Collaboration**: By engaging in group projects and collaborative exercises, youths develop the skills to work effectively in diverse teams. They learn the importance of listening to different perspectives and leveraging the strengths of each group member.
- **Critical Thinking and Problem Solving**: Training programs encourage youth to analyze complex problems, consider various solutions, and implement effective strategies. This skill set fosters innovation and resilience in facing challenges.
- **Goal Setting and Planning**: Teaching young leaders how to set realistic goals and develop actionable plans helps them navigate their projects effectively. This includes learning how to break down larger objectives into manageable tasks and track their progress.
- **Mentorship and Networking**: Providing opportunities for mentorship allows youths to connect with experienced leaders who can guide them. Networking skills foster relationships that can open doors to future opportunities and collaborations.

6.2 Mobilizing Peer Networks

Empowered youth serve as catalysts for change, mobilizing their peers and communities to adopt climate-smart practices. Initiatives such as youth-led forums encourage dialogues among young farmers, fostering shared responsibility and collaboration.

7. A Humanistic Approach to Climate Education

7.1 Ethical Considerations

Through its programming, Lersha embodies a humanistic approach that prioritizes values of inclusivity, equity, and ethics:

- **Social Justice**: Recognizing the disproportionate impacts of climate change on marginalized communities is crucial for designing equitable solutions.
- **Empowerment of Women and Minorities**: Lersha ensures that programs are inclusive, giving voice to young women, PWD, IDPs, and minorities who may traditionally be marginalized in agricultural sectors.

7.2 Promoting Empathy and Global Citizenship

A humanistic approach nurtures empathy among youths, encouraging them to understand their role in the global context of climate action. This perspective fosters a

commitment to local and global sustainability efforts.

7.3 Cultivating Lifelong Learning

Lersha encourages a culture of ongoing education, promoting the idea that adaptation to climate change is an evolving process. Through workshops and training programs, youths are encouraged to remain engaged and proactive.

8. Challenges and Opportunities

Despite the achievements facilitated by Lersha, certain challenges still impede progress, requiring comprehensive strategies:

8.1 Main Challenges

8.1.1 Infrastructure Limitations

Rural communities often experience infrastructural deficits that inhibit access to quality education and technology. Limited internet connectivity restricts the use of digital tools essential for effective climate action.

8.1.2 Market Instability

Young farmers frequently confront unpredictable market conditions that can deter commitment to climate-smart practices. Fluctuating prices for agricultural produce can lead to uncertainty, discouraging further investment.

8.2 Opportunities for Growth

8.2.1 Policy Advocacy

Lersha has opportunities to collaborate with local and regional policymakers to advocate for funding and support for youth-led climate initiatives, aligning with national goals for climate resilience.

8.2.2 Leveraging Technology

Emerging technologies, such as data analytics, robotics, and blockchain, can enhance Lersha's ability to support farmers in accessing markets and predicting weather patterns effectively.

8.2.3 Collaboration with Educational Institutions

Partnering with universities and training institutes can enhance Lersha’s capacity to provide skill development programs, further bridging the gap between education and practical application in agriculture.

9. Conclusion and Recommendation

9.1 Conclusion

Youth engagement and leadership are vital components of building climate resilience in Ethiopia. Green Agro Solution provides a paramount case study of how digital platforms can empower youth through education and resource access, promoting climate-smart agricultural practices. The integration of local knowledge, ethical considerations, and collaborative approaches highlights how effective climate education can lead to sustainable development in alignment with the SDGs.

As Ethiopia navigates the challenges posed by climate variability, investing in youth leadership becomes imperative. By strategically fostering the capabilities of the next generation, the nation can pave the way for a sustainable future, balancing economic, environmental, and societal needs.

9.2 Recommendations

To enhance the potential impact of youth engagement in climate action, the following recommendations are proposed:

- **Integrate Climate Change Education in Curricula**: Educational systems should incorporate climate literacy as a fundamental subject, aligned with the broader SDG framework.
- **Develop Community-Based Agricultural Projects**: Encourage practical, project-based approaches that connect youth directly with local agricultural practices.
- **Establish Intergenerational Mentorship Programs**: Encouraging partnerships between youth and experienced farmers can facilitate knowledge sharing and strengthen community bonds.
- **Strengthen Partnerships for Resource Mobilization**: Collaborating with local leaders, NGOs, and educational institutions can enhance the effective allocation of resources for climate initiatives.
- **Promote Gender Equality in Programming**: Ensure youth engagement strategies specifically address the barriers faced by young women and marginalized groups in agriculture.
- **Invest in Research and Innovation**: Stakeholders should prioritize research initiatives aimed at uncovering innovative practices that merge traditional knowledge with modern agriculture.
- **Implement Monitoring Frameworks**: Establishing processes to assess the effectiveness of youth engagement programs will facilitate continual learning and adaptation.

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Environmental Ethics and Values in Education: Building a Sustainable Future

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Abstract

Environmental ethics and values in education focus on equipping students with the necessary moral and ethical frameworks to understand and act upon environmental issues. This research investigates how embedding environmental ethics and values in education can shape students' perceptions, behaviors, and responsibilities towards sustainability. A sample of 200 secondary school students participated in a curriculum intervention designed to integrate environmental ethics into various subjects. Using a pre-test/post-test design, results indicate that exposure to environmental ethics significantly increased students' pro-environmental behavior and ethical awareness. The study underscores the importance of values-driven environmental education as a tool for creating a more sustainable future.

Keywords: Environmental ethics, sustainability, education for sustainable development, ethical awareness, secondary education

Introduction

The increasing severity of environmental crises—ranging from climate change to biodiversity loss—requires that the next generation be equipped with the knowledge, skills, and ethical frameworks to navigate these challenges. Environmental education has traditionally focused on cognitive aspects, such as understanding ecological systems and the science behind environmental issues. However, a critical gap remains in addressing the emotional, ethical, and moral dimensions of environmental challenges. Environmental ethics and values in education offer a humanistic perspective that not only informs students about the science of the environment but also encourages them to think critically about their role in protecting it.

Environmental ethics in education refers to the exploration of moral principles and values that guide human interactions with the natural world. It considers questions about what is right or wrong in environmental decision-making and the ethical implications of human actions on the planet. When

integrated into the curriculum, environmental ethics empowers students to take responsibility for their actions and advocate for sustainable solutions.

This paper explores how the incorporation of environmental ethics and values into educational practices can contribute to the development of ethical reasoning and responsible environmental behavior in students. It examines the effects of an intervention that embedded environmental ethics in various academic subjects, focusing on its impact on student attitudes, environmental awareness, and pro-environmental behaviors.

Background of the Study

Environmental education has evolved significantly over the years. While the early emphasis was on imparting scientific knowledge about the environment, recent developments in education theory stress the need to incorporate ethics and values into the learning process. Environmental ethics provides a framework through which students can critically evaluate human relationships with nature and develop a sense of responsibility for the planet.

The United Nations Educational, Scientific, and Cultural Organization (UNESCO) has highlighted the importance of incorporating ethical principles into education for sustainable development (ESD). UNESCO (2024) stresses that education should go beyond knowledge acquisition and foster values like respect, responsibility, and stewardship for the environment. Furthermore, as environmental problems become increasingly complex, there is a growing recognition that solutions require not only technical knowledge but also the moral courage to implement them.

Emerging research indicates that when students are exposed to environmental ethics, they are more likely to engage in sustainable practices and advocate for policies that support environmental justice. These students tend to demonstrate higher levels of eco-consciousness and a stronger commitment to community-based sustainability initiatives.

Statement of the Problem

Traditional environmental education often overlooks the importance of ethical reasoning and values-based learning. This research seeks to fill this gap by exploring how environmental ethics and values can be

integrated into the curriculum to foster greater environmental stewardship among secondary school students. The study aims to assess how the incorporation of ethical values into education influences students' understanding of environmental issues and their willingness to engage in sustainable practices.

Objectives of the Study

1. To assess baseline levels of environmental ethics and values among secondary school students.
2. To evaluate changes in students' ethical awareness and pro-environmental behavior following an intervention integrating environmental ethics.
3. To examine the impact of environmental ethics-based education on students' attitudes toward sustainability.
4. To explore the relationship between environmental ethics education and students' long-term commitment to environmental action.

Hypotheses

H1: Environmental ethics education will lead to a significant improvement in students' ethical awareness regarding environmental issues.

H2: Students exposed to environmental ethics will demonstrate a higher level of pro-environmental behavior post-intervention.

H3: There will be a positive correlation between the integration of environmental ethics in education and students' long-term commitment to sustainable practices.

Research Methodology

Research Design

A descriptive-correlational research design was used, employing a pre-test/post-test approach to assess changes in students' ethical awareness and environmental behaviors.

Sample

The study was conducted with 200 secondary school students aged 13–17 years, selected using purposive sampling to ensure a diverse representation from various educational backgrounds.

Tools

1. **Environmental Ethics Awareness Scale**: A validated tool measuring

students' understanding of environmental ethics and their moral reasoning concerning environmental issues.

2. **Pro-environmental Behavior Survey**: A questionnaire designed to assess students' behavior and attitudes toward sustainability.
3. **Standardized Academic Achievement Test**: To measure changes in students' understanding of environmental science before and after the intervention.

Procedure

Students participated in a curriculum intervention incorporating environmental ethics into subjects such as science, social studies, and geography. Activities included ethical debates on environmental issues, case studies, role-playing scenarios, and discussions about the moral implications of environmental decisions.

Pre- and post-test data were collected to measure changes in students' environmental ethics awareness and their engagement with sustainable practices.

Statistical Techniques

Means, standard deviations, paired sample t-tests, and Pearson correlations were used to analyze the data.

Results and Discussion

Descriptive Statistics of Environmental Ethics and Pro-environmental Behavior (N=200)

Variable	Mean (Pre)	SD (Pre)	Mean (Post)	SD (Post)
Environmental Ethics Awareness	3.50	0.78	4.10	0.70
Pro-environmental Behavior	2.80	0.65	3.45	0.60

The data reveal significant improvements in both environmental ethics awareness and pro-environmental behavior. The mean for environmental ethics awareness increased from 3.50 to 4.10, and pro-environmental behavior rose from 2.80 to 3.45.

Paired Sample t-Test Results (N=200)

Variable	t-Value	p-Value
Environmental Ethics Awareness	-8.24	<0.001
Pro-environmental Behavior	-9.12	<0.001

The paired sample t-test results indicate statistically significant improvements in both environmental ethics awareness and pro-environmental behavior post-intervention (p-values < 0.001).

Correlation Between Environmental Ethics and Pro-environmental Behavior (N=200)

Variables	Pearson's r	p-Value
Post-Ethics Awareness & Post-Behavior	0.52	<0.001

A moderate positive correlation (r = 0.52) between post-intervention ethics awareness and pro-environmental behavior suggests that students who developed a stronger ethical understanding were more likely to engage in sustainable actions.

Conclusion

The findings of this study provide compelling evidence that integrating environmental ethics into the curriculum enhances students' ethical awareness and pro-environmental behavior. By incorporating ethical reasoning into environmental education, students are better prepared to navigate the complex moral challenges posed by environmental degradation and climate change. This approach fosters a generation of learners who are not only knowledgeable but also morally engaged in creating sustainable solutions.

Recommendations

1. Incorporate environmental ethics into all educational levels, particularly in science and social studies curricula.
2. Develop teacher training programs focused on the integration of ethics and values in environmental education.
3. Implement school-based sustainability projects that encourage students to practice what they learn about environmental ethics.
4. Conduct further research on the long-term impact of environmental ethics education on students' behaviors and

societal contributions to sustainability.

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Education for Climate Resilience: A Humanistic Perspective

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Abstract

Education for climate resilience from a humanistic perspective focuses on empowering individuals to confront and adapt to the impacts of climate change while fostering values such as empathy, social responsibility, and global citizenship. This study examines how humanistic educational approaches, which integrate emotional, ethical, and social dimensions, can enhance climate resilience among students. The research investigates the impact of a climate resilience curriculum that incorporates empathy, moral reasoning, and community-based learning on students' understanding of climate change and their capacity to respond to it. Results show significant improvements in students' emotional resilience, environmental awareness, and preparedness for climate action, emphasizing the importance of human-centered learning in fostering sustainable communities.

Keywords: Climate resilience, humanistic education, environmental awareness, sustainability, emotional resilience, secondary education.

Introduction

As climate change becomes an ever-more urgent global crisis, the need for education systems to equip students with the knowledge, skills, and values necessary to cope with its impacts is paramount. Education for climate resilience goes beyond teaching students about the scientific aspects of climate change; it involves preparing them to actively participate in climate adaptation and mitigation efforts. Central to this approach is the humanistic perspective, which integrates emotional intelligence, ethical reflection, and a sense of shared responsibility.

Humanistic education focuses on the holistic development of students, addressing not only their cognitive and intellectual capacities but also their emotional, ethical, and social dimensions. In the context of climate resilience, this means fostering a deep understanding of the interconnectedness between human actions and environmental systems. By embedding empathy, compassion, and

social responsibility in the curriculum, humanistic education encourages students to engage with climate issues on a personal and community level, ultimately leading to more sustainable behaviors and a greater commitment to global climate action.

This paper explores how humanistic education, with its emphasis on empathy and ethical reflection, can support climate resilience. It examines the role of education in preparing students to face the challenges posed by climate change, while promoting a sense of responsibility toward the environment and future generations.

Background of the Study

Climate change education has traditionally focused on providing students with factual knowledge about the science of climate change, its causes, and its effects. However, recent research highlights the limitations of purely cognitive approaches, arguing that emotional and ethical learning is equally important in preparing students for climate resilience. Humanistic approaches to education emphasize the development of values, social skills, and emotional intelligence—qualities that are critical for addressing the complex and often overwhelming nature of climate challenges.

Studies have shown that climate resilience requires not only an understanding of environmental science but also the ability to emotionally engage with climate issues. Empathy for those affected by climate change, a strong ethical framework, and a commitment to social justice are essential components of resilience. Furthermore, the integration of community-based learning helps students understand the importance of collective action in building sustainable futures.

UNESCO's Education for Sustainable Development (ESD) framework supports this approach, advocating for education that fosters the development of skills and values necessary for a sustainable and resilient future. This study builds on existing literature by exploring how humanistic education—focused on empathy, emotional resilience, and ethical engagement—can contribute to climate resilience.

Statement of the Problem

Traditional climate change education often fails to address the emotional and ethical aspects of climate challenges, which can hinder students' ability to connect with the issues on a deeper level. Without addressing these dimensions, students may experience climate change as a distant or

abstract problem, making it difficult for them to take meaningful action. This research seeks to explore how humanistic approaches to climate education can enhance emotional resilience, promote ethical responsibility, and foster a sense of shared accountability for climate change.

Objectives of the Study

1. To assess the impact of humanistic education on students' emotional resilience in the face of climate challenges.
2. To evaluate the effectiveness of empathy-based learning in improving students' understanding of climate resilience.
3. To examine the relationship between ethical reasoning in climate education and students' readiness to participate in climate action.
4. To investigate the role of community-based learning in enhancing students' sense of responsibility toward climate resilience.

Hypotheses

H1: Students who participate in humanistic climate resilience education will demonstrate higher levels of emotional resilience compared to those who receive traditional climate change education.

H2: Empathy-based learning will significantly increase students' understanding of climate resilience.

H3: Ethical reasoning will positively correlate with students' readiness to engage in climate adaptation and mitigation activities.

H4: Community-based learning will enhance students' sense of responsibility toward sustainable climate actions.

Research Methodology

Research Design

A quasi-experimental research design was adopted, with two groups: one receiving humanistic climate resilience education and the other receiving traditional climate education. Both groups were assessed before and after the intervention to measure changes in emotional resilience, climate awareness, and pro-environmental behavior.

Sample

The study involved 200 secondary school students aged 13–17 years, selected from a range of educational institutions. The students were randomly assigned to either

the humanistic education group or the traditional climate education group.

Tools

1. **Emotional Resilience Scale**: A tool to measure students' ability to cope with climate-related stressors and uncertainties.
2. **Climate Resilience Knowledge Assessment**: A standardized test to measure students' understanding of climate change, its impacts, and resilience strategies.
3. **Ethical Reasoning Questionnaire**: A scale to assess students' moral reasoning and decision-making abilities related to environmental issues.
4. **Pro-environmental Behavior Survey**: A tool to assess students' readiness to take part in climate action and sustainable practices.

Procedure

Students in the experimental group were taught using a humanistic climate resilience curriculum that integrated empathy, ethical reasoning, and community engagement activities. These included role-playing, case studies of climate-affected communities, reflective discussions, and participatory local climate action projects. The control group followed a traditional curriculum focused on the scientific aspects of climate change.

Data were collected at the beginning and end of the intervention to assess changes in emotional resilience, ethical reasoning, and pro-environmental behavior.

Statistical Techniques

Means, standard deviations, paired sample t-tests, and Pearson correlations were used to analyze the data.

Results and Discussion

Descriptive Statistics of Emotional Resilience and Climate Resilience Knowledge (N=200)

Variable	Mean (Pre)	SD (Pre)	Mean (Post)	SD (Post)
Emotional Resilience	3.25	0.68	4.05	0.60
Climate Resilience Knowledge	62.4	12.3	75.2	10.8

The data show that emotional resilience and climate resilience knowledge both increased significantly after the intervention. The emotional resilience mean score rose from 3.25 to 4.05, and the climate resilience knowledge score increased from 62.4 to 75.2.

Paired Sample t-Test Results (N=200)

Variable	t-Value	p-Value
Emotional Resilience	-9.57	<0.001
Climate Resilience Knowledge	-12.28	<0.001

The paired sample t-tests indicate statistically significant improvements in both emotional resilience and climate resilience knowledge, with very low p-values (< 0.001).

Correlation Between Ethical Reasoning and Pro-environmental Behavior (N=200)

Variables	Pearson's r	p-Value
Post-Ethical Reasoning & Post-Behavior	0.48	<0.001

A moderate positive correlation (r = 0.48) was found between ethical reasoning and pro-environmental behavior, indicating that students who developed stronger ethical reasoning also demonstrated greater readiness to engage in climate action.

Conclusion

This study highlights the importance of humanistic education in building climate resilience. By integrating empathy, ethical reasoning, and community-based learning, humanistic climate education not only increases students' knowledge of climate change but also enhances their emotional resilience and readiness to engage in sustainable actions. These findings underscore the need for educational systems to adopt human-centered approaches that address both the cognitive and emotional aspects of climate challenges.

Recommendations

1. Incorporate humanistic education principles into climate resilience curricula across all educational levels.
2. Provide teacher training on how to integrate empathy and ethical reasoning into environmental education.
3. Promote community-based climate action projects that encourage students to apply their learning in real-world contexts.
4. Support longitudinal studies to further explore the long-term impact of humanistic climate education on students' environmental behaviors.

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Punjabi Language- Web based learning Tools

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Punjabi is one of the top 15 languages spoken worldwide, according to statistics. Over time, this rating has changed, ranging from 10 to 18. With over 90 million native speakers and over 140 million speakers in 150 countries worldwide, Weber's (1997) article titled "The World's 10 Most Influential Languages" honors Punjabi as one of the top 10 languages in the world. Many countries with Punjabi immigrants speak Punjabi, including Pakistan, Canada, the United States, the United Kingdom, and India.

Despite being a required school subject in Punjab, Punjabi is losing momentum against English. About 40% of pupils who passed the Class 12 Punjab board exam in 1995 chose Punjabi as an elective, according to The Tribune (November 25, 2017). This dropped to 24% by 2017. One important contributing aspect is that more students are opting to major in business or science. However, there is dishonesty inside the humanities community as well. In 1995, 46% of arts students chose Punjabi as an elective; by 2017, that number had dropped to 35%. However, the problem begins early because a significant portion of Punjabi children come from rural areas where the quality of instruction in public schools is very low. According to Pratham, a reputable NGO that works to provide quality education for the impoverished, at least 46% of Class 4 children were unable to read books (in Punjabi) from Class 2. 20% of students couldn't read the text from Class 1, and 4.4% of students didn't even know the alphabet till Class 3.

According to The Tribune (August 31, 2018) as many as 27,659 children who had Punjabi as their mother tongue failed the subject in this year's Class X Punjab State Education Board exams, down the pass rate from 93.35% to 91.77%.

It is also important to closely watch and analyze how Punjabi is taught and learned in schools. When teaching Punjabi, it is undeniable that the teacher gains from using a range of instructional strategies. Teachers are far more picky when it comes to teaching methods in the current scientific and technological era. They must employ an appropriate technique, strategy, and style of instruction if they wish to

make teaching and learning meaningful. Web-based language learning is one such approach.

As stated by Jonassen (1996), "when students study with equipment, it converts a mind tool." He describes "mind tools" as "computer-based learning environments and tools that have been modified or created to serve as knowing partners with learners to engage and support advanced order learning and critical thinking."

Achievement in Punjabi can be raised by combining technology with conventional classroom teaching methods. In order to teach Punjabi to school students, web integrated learning is quickly becoming a viable teaching and learning method. .

Web based Language Learning

Web based learning refers to all educational initiatives utilizing the internet (or a local intranet), and it includes three main configurations or categories: instructional, online discussion forums, and virtual achievements. According to McKimm et al. (2003). Web-based learning, which includes online course content, is frequently referred to as online learning or e-learning. The internet makes it feasible to participate in discussion boards via email, have video conferences, and stream live courses. Web-based courses may also offer static pages similar to printed course materials.

The term "web-based education" (WBE) refers to all facets and elements of education that make use of the World Wide Web as a communication tool and auxiliary technology. WBE is referred to by a variety of different names, including online education, virtual education, Internet-based education, and education through computer-mediated communication (Paulsen, 2003).

Web-based learning is a style of education in which different learning tasks are carried out using the Internet as a means of delivering instruction. Depending on the needs and requirements of the curriculum, it can either take the form of (1) pure online learning, where the curriculum and learning are implemented online without face-to-face meetings between the instructor and the students, or (2) a hybrid, where the instructor meets the students half of the time online and half in the classroom. Web-based learning can be added as a supplement to conventional courses or integrated into a curriculum that develops into a full-fledged course (Zheng, 2008).

The most common way that teachers utilize the Internet in the classroom is to look up Web resources to learn new knowledge. The Web can

significantly contribute to the development of a resource-rich environment by giving Punjabi a wide variety of exposure. The teaching-learning process is made more successful by integrating the web into classroom activities, which can be especially beneficial for students. Any Web-browsable material, data, and applications can be easily and quickly integrated into portals, wireless devices, and Web services through web integration.

Web Integrated Language Learning Resources for Punjabi Language Learning

The concept of "Web Integrated Tools" in Punjabi refers to resources and applications that have been specifically developed to support and improve Punjabi-language web-based activities and experiences. These resources can be used in a variety of settings, such as language processing, creating material, communication, and user experience. It involve two types of Web integrated language resources which are Premade Resources and Activity based Resources that can be involved, created and used. Which are given below-

Pre-made Web Resources: There are a number of convenient and cost-free Punjabi language practice resources on the web, which include Web tools Applications, blogs, YouTube channels, audio files, and graphic images that can use to assist students in improving their learning environment. Some of the best web integrated learning resources that teacher can use are given below:

Webtools

I. **Mentimeter**: With Mentimeter teachers can create Quiz questions, Spinning Wheels, Question Answer and Word clouds. Results are anonymous therefore students can submit answers without fear of Judgement (Hanifan, 2020, Gavranovic & Michos, 2022).

II. **Animoto**: Animoto is a free classroom tool for educators, students, and administrators to create and share videos with your class, with parents, and beyond. No software downloads required. It lets teachers to use videos as part of their lesson plan and also allows students to create visually creative presentations (Gavranovic & Michos, 2022).

III. **Kahoot**: Kahoot is a live Engagement tool where teacher can turn boring lesson into a game to motivate the students. Kahoot Website create a playable game with questions and answers. Students can download the app to use as a buzzer to join in (Gavranovic & Michos, 2022).

IV. **Quizizz**: Provides gamifies learning content that creates more engaging and immersive Learning. Quizizz significantly improve Educational outcomes and reduce ramp-up time. With AI creating or importing content into Quizizz takes only minutes, With Quizizz, Learner can engage in live sessions or remote learning. Learners receive instant feedback, which can be used to further improve the content (Gavranovic & Michos, 2022).

Educational Applications Funded By the Punjab Government

Information and communication technology (ICT) is an effective tool for learning Punjabi. There is software available that supports the Punjabi script, like Akahr. Many websites, such as Punjabi pedia, are helpful aids for learning Punjabi. Unicode software makes it simple to input keywords in Punjabi script (Kaur, 2017). The educational applications funded by Punjab Government are: Punajab Educare App: The Punjab Government's "Punjab Educare App," which evolved to enhance schoolchildren's education, has set an entirely novel standard for online learning. E-Learn Punjabi App: The Punjab School Education Board launched a website for online Punjabi study in order to promote and support the teaching of Punjabi around the world. iScuela learn Mobile App : Engaged in partnership with the Punjab State Government and Rotary India Literacy Mission (RILM) to digitize and digitalize all 19,272 public schools throughout the Punjab State (Jain & Padmapriya, 2025; Kaur, 2017).

Punjab Educare App

The Punjab Government's Punjab Education App was developed to improve school education and set a completely new standard for online learning. More than 350 million people have already seen it. On average, more than 87,000 people visit the site every day. Over 1.6 million people have downloaded and are currently using the app, mainly students and instructors, highlighting its importance (Directorate of Information and Public Relations, Punjab, India, 2017). On July 11, 2020, Punjab Educare was launched to support online education for students. Interestingly, it was a team of school teachers from Jalandhar - Deepak Kumar, Jaswinder Singh, Harjit Kumar, Haridarshan Singh, Chander Shekhar, and Omeshwar Narayan, having no IT background or expertise support, who initially developed the ‘Punjab Educare App’ with their sheer dedication coupled with indigenous innovations. To overcome the challenges of remote learning, teachers from Punjab without any budgetary planning and IT expertise

designed this learning app which soon became the epicenter of digital education in the state and gradually adopted by many other states of India. For accelerating the pace of qualitative improvement in education and to make teachers well-versed in the use of advanced IT applications, capacity-building programs were organized by the Education Department (The Tribune, July 11, 2021).

The app is a one-stop solution to the accessibility of study materials. It provides systematically organized study materials, including books, audio/video courses, and daily assignments on all subjects. This is a user-friendly app that eliminates the worry of losing the useful learning materials provided daily by the Ministry of Education. It is an additional tool for teachers and students. Teachers and students can easily access course materials, PDF books, audio/video lectures, worksheets, assignments, word wall activities, quizzes, and study materials for competitive examinations (NTSE, NMMS, PSTSE, etc.). It provides a curriculum for pre-primary to XII years, test questions, daily slides, and homework assignments for all classes. In addition to the data about teaching resources, the application also provides learning results. All course materials, textbooks, videos, and Edusat lectures on various subjects were also published under the Second and Second Secondary Wings. It helps teachers and students to recapitulate any topic as often as they like.

According to Singh (2022), “Punjab Educare App” became the state's digital education hub and was adopted by many other Indian states to overcome remote learning challenges. Kaur et al. (2021) also noted that the "Punjab Educare app" is cost-effective, teacher and student-friendly, and best suited for delivering prescribed curriculum to transfer information and develop skills, aptitudes, and interest to continue education in difficult times. All Punjab secondary schools and the public had access to technology-based digital courses, which improved student academic performance, and were scored 4.4 out of 5 on a 5-point scale. The digital modules that have been produced in this state have emerged as prominent pioneers and exemplars inside the nation.

The main features of the Punjab EduCare App are as follows: It provides a learning resource store with all the study resources of the main subjects of pre-primary to XII classes, contains not only online text-based learning material but also video lessons delivered by the experts in the field, It is compact, easy to use and promotes perfect coordination between

teachers and students, keeps parents up-to-date about their children's performance, Bilingual features make use more convenient. In addition to interactive and virtual learning, there are also day thoughts, daily assignments, Udaan competition examination series, question bank, examination series, national talent search examination, and national merit scholarships scheme (Directorate of Information and Public Relations, Punjab, India, 2017).

The Punjab EduCare App offers a variety of functions including:

I. **Curriculum:** The app provides access to the Punjab state curriculum for all grades which includes textbooks, notes, and practice questions (Ranjit, 2023).

II. **Videos:** The app offers a library of educational videos that cover a variety of topics. These videos are created by experts and can help students learn in a fun and engaging way (Ranjit, 2023).

III. **Quizzes:** To assess student's knowledge, the app offers a variety of quizzes. These quizzes are aligned with the Punjab state curriculum and can help students identify areas where they need more practice (Ranjit, 2023).

IV. **Discussion forums:** Students can post questions in the app's discussion boards and receive answers from other students and teachers. This is an excellent opportunity for students to learn from one another and receive assistance with their coursework (Ranjit, 2023).

V. **Individualized Education Plan**: Plans for each student's education can be created. The student's success on tests and other evaluations can be planned. This aids pupils in concentrating on the areas where they most need assistance (Ranjit, 2023).

The Punjab Educare app is a helpful tool for Punjabi students because it provides a variety of features that can help students learn and prepare for exams. The app can be downloaded and used without charge on both iOS and Android-powered smartphones. This app can enhance pupils' academic achievement.

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Education and the Human Spirit: A New Vision for Climate Sustainability – A Music-Integrated Approach

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Abstract

Climate change poses unprecedented challenges requiring not only scientific understanding but also the empowerment of the human spirit. This research paper explores how music-integrated climate education can strengthen emotional resilience, deepen ecological awareness, and foster sustainable behavior among learners. Drawing on environmental psychology, educational policy insights, and music-based pedagogies, this study examines the transformative role of music in shaping climate consciousness. Using a mixed-method design and analyzing contemporary climate education frameworks, the paper highlights the potential of music as a pedagogical tool to inspire collective action, nurture empathy, and promote long-term climate sustainability.

Introduction

Climate sustainability has emerged as a global priority, demanding innovative educational approaches that go beyond cognitive learning. Traditional climate education focuses primarily on environmental science, policies, and data-driven understanding. However, the growing emotional and psychological impact of the climate crisis—such as eco-anxiety, detachment, and hopelessness—reveals a gap between knowledge and meaningful action. To bridge this gap, education must evolve to nurture the *human spirit*: empathy, resilience, creativity, and collective solidarity.

Music, as a universal language, plays a powerful role in shaping human emotion, identity, and social connection. Historically, music has supported social movements, cultural memory, and healing in times of crisis. When integrated into climate education, music can help learners process complex environmental emotions,

foster ecological identity, and strengthen motivation for climate action.

This research paper explores how music-integrated educational practices contribute to climate sustainability by igniting the human spirit, enhancing emotional engagement, and cultivating a deeper connection between learners and the natural world.

Music-Integrated Climate Education

Climate education is undergoing a paradigm shift that recognizes the importance of emotional, cultural, and creative dimensions of learning. Contemporary studies in environmental psychology indicate that music enhances emotional regulation, attention, and memory—all critical components of sustained climate engagement.

Emotional and Psychological Impact of Music

Music has been shown to:

- Reduce stress and anxiety through rhythmic and melodic regulation
- Activate empathy and compassion by engaging emotional centers of the brain
- Strengthen personal and collective identity
- Enhance reflective thinking and introspection

These qualities make music a powerful complement to climate education—particularly for young learners navigating climate-related fears.

Music as a Tool for Ecological Awareness

Music-based activities, such as soundscape creation, eco-songwriting, and rhythm-based storytelling, provide learners with experiential ways to connect with nature. These practices help internalize climate concepts more effectively than lecture-based methods.

Statistical Snapshot of Climate Education and Emotional Wellbeing

Although global data on music-integrated climate education is emerging, existing research on climate learning and student wellbeing offers insight into the importance of new pedagogical approaches.

Table 1: Climate Awareness Levels Among Adolescents (Global Study, 2022)

Region	High Awareness (%)	Moderate Awareness (%)	Low Awareness (%)
Europe	62.4	31.2	6.4
Asia	54.1	35.7	10.2
Africa	46.8	41.3	11.9
North America	58.3	33.6	8.1
Global Average	55.4	35.5	9.1

Table 2: Prevalence of Eco-Anxiety Among Youth (Age 13–18)

Country Group	Percentage Reporting Climate-Related Anxiety
High-income countries	45%
Middle-income countries	57%
Low-income countries	62%

The high rate of eco-anxiety highlights the pressing need for emotionally supportive climate education—an area where music can play a healing and empowering role.

Music as a Vehicle for Climate Resilience

1. Strengthening Emotional Resilience

Music-based climate lessons allow students to:

- Express climate-related fear or hope through lyrics and rhythm
- Build coping strategies through melodic patterns
- Experience emotional release (catharsis) during musical engagement

2. Enhancing Climate Communication

Music enables learners to communicate climate messages creatively:

- Climate-themed songs
- Musical performances during environmental campaigns
- Rhythm-based climate data visualization

These approaches make climate communication relatable, memorable, and socially engaging.

3. Building Collective Solidarity

Group musical activities foster collaboration, empathy, and mutual support—qualities essential for climate

activism and community-based sustainability initiatives.

Vocational and Skill-Based Potential of Music in Climate Education

Music-integrated climate education also offers career and vocational possibilities, aligning with sustainability-related industries:

Table 3: Emerging Music-Creative Careers Supporting Climate Sustainability

Sector	Music-Integrated Role
Environmental Advocacy	Climate campaign composers, sound designers
Eco-Tourism	Nature-sound artists, environmental storytellers
Education & Training	Climate music educators, eco-workshop facilitators
Media & Communication	Environmental content creators, documentary sound engineers

These opportunities show how climate education and music can merge into sustainable livelihoods.

Conclusion

"Education and the Human Spirit" calls for a transformative approach to climate learning—one that awakens emotion, creativity, and collective responsibility. Integrating music into climate education ignites deeper ecological awareness, nurtures emotional resilience, and strengthens students' connection to the planet. Music's ability to heal, inspire, and unify makes it a powerful tool for climate sustainability.

This music-integrated vision has the potential to:

- Reduce eco-anxiety
- Increase climate engagement
- Foster long-term sustainable behavior
- Inspire community-level action

By adopting such a holistic model, educational institutions can cultivate generations of learners who are not only informed about climate science but also spiritually connected to the Earth,

emotionally resilient, and creatively empowered to shape a sustainable future.

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