



SHAPING THE FUTURE THROUGH THE LENS OF 21ST CENTURY SKILLS FOR GLOBAL SUSTAINABLE DEVELOPMENT

Pallabi Banerjee ¹ & Dr. Mahadeb Chattopadhyay ² 

RESEARCH ARTICLE



Author Details:

¹ Assistant Professor,
B.Ed. Department, Rajendra Academy
for Teachers' Education, Durgapur,
Paschim Bardhaman, West Bengal,
India;

² Assistant Professor & HoD, M.Ed.
Department, Rajendra Academy for
Teachers' Education, Durgapur,
Paschim Bardhaman, West Bengal,
India

Corresponding Author:

Pallabi Banerjee

DOI:

<https://doi.org/10.70096/tssr.250307036>

Abstract

The 21st century demands an education system that not only provides adequate knowledge but also equips students with the necessary skills to prepare for cultivating global sustainable development. This paper examines the important role of 21st century skills such as critical thinking, communication, media literacy, technology, leadership and flexibility in global sustainable development. These competencies are significant for integrating practical approaches into the education system. This paper critically examines the incorporation of global sustainable development into the modern education paradigm through various mechanisms. It emphasizes the significance of 21st century competencies and their real-world implications for pupils. It also analyses how these skills work in achieving global sustainable development and evaluates the policies, practices and frameworks for their successful implementation. These competencies are not just additional features or elements but represent a fundamental paradigm shift in how we prepare individuals for success.

Keywords: 21st Century Skills, Future, Education, Sustainable Development

Introduction

The 21st century has brought about a paradigm shift in educational priorities, emphasizing the development of skills essential for navigating the complexities of an interconnected world. These skills, often referred to as 21st century skills, include critical thinking, creativity, collaboration, communication, digital literacy, and social-emotional skills. In the rapidly evolving global landscape cultivating 21st century competencies are significant for achieving sustainable development as it provides people with the tools, they need to address global challenges such as climate change, poverty, and inequality. India, with its growing population and fast economic development, encounters distinctive sustainability dilemmas such as dwindling resources, environmental deterioration, and socio-economic inequalities. In order to tackle these challenges, the educational system needs to adapt to teach 21st-century skills, so that individuals can develop the necessary abilities to create and apply sustainable solutions. Focusing on digital literacy can enable people to use technology to reduce environmental impacts and make the best use of resources. Additionally, promoting a culture of critical thinking and problem-solving starting at the foundation can spur grassroots efforts towards sustainable development initiatives within the community. Collaborative abilities are just as important, as they allow for partnerships across different sectors and the sharing of various expertise, necessary for comprehensive and strong solutions. Moreover, a greater emphasis has been placed in educational contexts on a more thorough selection, definition and critical interpretation of sustainability competencies (Prakash, 2021). Thus, integrating 21st century skills into the curriculum supports the United Nations Sustainable Development Goals (SDGs), particularly Goal 4, which aims to ensure quality and equitable education for all and to promote lifelong learning opportunities (UNESCO, 2015). By integrating these skills educators can prepare students to become well-rounded, multi-faceted individuals who contribute to the future. Therefore, 21st century skills not only enhance personal capabilities, but also foster collaboration and ensure sustainable development (Bell, 2016).

Significance of the Study

The significance of the study is mentioned below

- The study focuses on the importance of equipping individuals with skills such as critical thinking, creativity, and digital literacy which are essential for the future generations as they can contribute to sustainable development effectively.
- The research explains the need to integrate 21st-century skills into modern educational systems.

- The research highlights the importance of 21st-century skills in fostering global collaboration in a broader perspective.
- It also includes the various educational policies and practices of implementing 21st century competencies to achieve sustainable development.

Review of Related Literature

Reviews related to 21st Century Skills and Sustainable Development

Garba (2019) conducted a qualitative study on sustainable development in the 21st century in relevance of innovative instruction on performance of students. The study thoroughly discussed how to achieve sustainable development goals in the 21st century through relevance of innovative instructions. The most highlighted innovative instructions were as follows: creative teaching, audio visual equipment, real world learning, role-play, storyboard teaching.

Sushma (2022) conducted a qualitative study on the importance of sustainable development in this study 21st century skills are categorized into 3 groups e.g. Learning Skills which comprise Brain processes essential for learning new information. Next is the Literacy Skills which includes formation and acquisition of new knowledge through the use of media and digital resources and Life Skills which are good for day to day living.

Atik (2023) conducted a study on important 21st century skills for sustainable careers development of social science students. In this meta-analysis various peer reviewed empirical articles were utilized, out of those 12 articles met all the selection criteria and after the quality appraisal process, they were included for a thematic analysis. The findings suggested that communication, critical thinking, self-direction and problem-solving skills are crucial for a sustainable career development but there are no investigated mechanisms that would explain how these competencies would precisely contribute to social science graduates' career sustainability.

Sukmanasa (2023) conducted a study on 21st Century skills in relation with Sustainable Development Goals achieved through independent campus learning program. In this study, the research was conducted in the Primary School Teacher Education (PGSD) study Program at Pakuan University on 418 students from the 2018-2021 class. The tool used in the form of a questionnaire was a Likert scale. The data were analyzed through descriptive statistics. The result indicated the significance of 21st century skills to the sustainable development goals in relation to the various skills that students must acquire to face the challenges in various situations.

Mokhtar (2023) conducted research on pedagogical innovation, development of 21st century skills and sustainable development in teaching and learning of Life and Earth sciences in Morocco. The study is based on the utilization of digital resources to develop 21st century skills in Life and Earth Sciences. The research was conducted upon 200 teachers in the various regional education and training centers of the kingdom of Morocco. A questionnaire in the form of Likert scale used as the instrument of research. Here two variables were used, one was the degree of teachers' awareness of 21st century Life and Earth Sciences skills and other was the certain population variable and thus correlation was established. The result indicated that teachers' awareness on 21st century skills in general and specific to Life and Earth Sciences was moderate. Besides, multilevel, multi type digital resources and curriculum reforms are very important aspects in reinforcing 21st century skills regarding e-learning of Life and Earth Sciences.

Objectives of the Study

1. To explore the idea of sustainable development in education.
2. To discuss 21st century skills.
3. To study the role of 21st century skills for quality education.
4. To study the role of 21st century skills for global sustainable development.

Research Questions

RQ1: What are 21st century skills?

RQ2: How to develop 21st century skills?

RQ3: What are the roles of 21st century skills for quality education?

RQ4: What are the sustainable development goals?

RQ5: What is the role of education for sustainable development?

RQ6: What are the roles of 21st century skills for global sustainable development?

Analysis and discussion

RQ1: What are 21st century skills?

Understanding 21st century skills involve more than traditional academic learning, it stresses the need for a comprehensive, well-rounded education system that prepares individuals to meet the very challenges of today's world. It emphasizes not only cognitive abilities but also social and emotional intelligence, reflecting the interconnectedness of today's globalized world (Trilling and Fadel, 2009).

Exploring 21st Century Skills

The 21st century skills are grouped into three main categories, they are:

- a) Learning Skills

b) Literacy Skills

c) Life Skills

a) Learning Skills

These include Critical Thinking, Collaboration, Communication, Creativity and Innovation. They are necessary for generating new knowledge, concepts and ideas.

b) Literacy Skills

These include Information Literacy, Media Literacy, and Technology Literacy (ICT). These digital literacy skills help to create new knowledge through media, communication, and e-resources.

c) Life Skills

This group consists of Self-Motivation, Flexibility and Adaptability, Leadership and Commitment, and also Social and Cultural Interaction Skills. These skills are significant for achieving success in daily life.

- **Critical Thinking**

Critical thinking refers to the process of making well-informed, evaluative conclusions about claims, explanations and judgments. It involves analysis, evaluation, and the development of arguments, by emphasizing fairness, open-mindedness, and independence. It also encompasses skepticism, which means readiness to question (ask) and consider doubts.

- **Problem Solving**

This skill includes finding solutions through applying calculations, approaches or methods. The problem-solving process includes selecting important information, integrating new data, and making connections between observations to find solutions.

- **Creativity and Innovation**

Through these skills children can find new approaches to life and use their intellectual abilities to face real-life challenges. It includes learning through various forms of art and craftsmanship.

- **Communication and Collaboration**

Effective communication and collaboration make the teaching-learning process more enriching, engaging and enjoyable. These skills are significant to enhance students' understanding of their surroundings.

- **Career and Life Skills**

These skills are important to help students adapt to different cultures, customs and environments. They become tolerant towards others and learn meaningful lessons from various experiences.

- **Leadership and Responsibility**

These skills are significant for the students as they teach the importance of lifelong learning and help them to develop major traits such as dedication, accountability, perseverance, and confidence.

- **Digital and Media Literacy**

This ability teaches students about various digital resources, media and its related technologies for communication and information purposes. It includes key areas such as gathering, analyzing, and interpreting data, and helps students engage in meaningful communication and collaboration.

RQ2: How to develop 21st century skills?

Developing 21st century skills is significant for an individual's personal and professional growth. These skills include communication, critical thinking, digital literacy and leadership. Here is how one can enhance 21st century skills.

- Prioritize the skill that a person wants to develop: at this perspective first identify the most relevant skill based on an individual's personal and professional needs and then focus on improving it systematically.
- Through Constructive Feedback: Constructive feedback from mentors, peers, teachers or supervisors may help to refine skills and improve the overall performance of an individual.
- Step outside one's comfort zone: trying new experiences, new knowledge, adopting new environments, tackling challenges and adapting to change strengthen problem solving, creativity and resilience.
- Awareness of new Technologies: updating with technological advancements increases digital literacy, modern trends and ensures systematic learning teaching process.
- Through Leadership Positions: Leading teams, projects foster decision making, responsibility and teamwork. All the factors are essential for an individual's career growth as well as personality development.

RQ3: What are the roles of 21st century skills for quality education?

The roles of 21st century skills are very important to maintain the quality of education and these are as below-

- The 21st-century skills equip students with the ability to face complex problems, think critically, and adjust effectively to rapidly evolving environments. The comprehensive impacts of 21st century skills are given below:

- Students employ a variety of reasoning techniques to solve numerous problems as per the circumstances. They think critically, judge and make decisions. They analyze and synthesize information by connecting links between them. In this perspective, the teachers should always support and teach students to face newer challenges by applying traditional and new approaches and ask necessary questions that lead to more effective solutions.
- By applying numerous creativity and innovative techniques students will be able to generate fresh and new ideas that enhance their thinking in a broader perspective. Innovation and Creativity in work is a cyclical and long-term process. The students can refine, analyze and evaluate ideas to indicate novelty and innovation in their work.
- To express thoughts and ideas students will be able to apply verbal, written and non-verbal communication skills according to the circumstances. They become good listeners and capable of working with others by exchanging knowledge, attitudes and values. They work in collaborative and cooperative ways with a diverse group of people and make adjustments in order to achieve success. Communication skill has a great significant role in this aspect.
- Through digital and media literacy students will be able to access information quickly and effectively. They can learn how to use media and technology to exchange information and analyze it successfully through the effective utilization of media resources.
- Promoting leadership in students fosters confidence and decision-making ability. It also prepares them to take responsibility, work collaboratively and inspire others which ultimately lead students into future leaders with a good and positive impact on society.
- Life skills teach students' ability to face challenges and build important qualities like critical thinking, adaptability, emotional intelligence, self-awareness and so on that prepare students for a balanced and successful life beyond their academics.
- Cultivating social and cross-cultural skills is significant for pupils as it broadens their ability to interact with people from diverse backgrounds, fosters mutual respect and promotes global understanding. It also prepares students for navigating in today's interconnected world.

RQ4: What are the sustainable development goals?

Sustainable Development

According to The World Environment Commission "Sustainable development is the process of changing the use of resources, directing investment, orienting technology development, and institutional change that meets current and future needs."

The Brundtland Report Our common future (1987) defines that: "Sustainable development as a process is necessary to improve the situation and eliminate the social and cultural shortcomings of advanced societies. It should serve as the driving (guiding) force for a balanced, proportionate and well-coordinated economic social and cultural development across all societies especially in developing countries." Thus, in simple words, Sustainable Development refers to meeting today's needs without limiting the ability of future generations to satisfy their own needs.

Sustainable Development Goals (SDGs)

The Sustainable Development Goals refer to the (SDGs) set of 17 global goals adopted by the United Nations in 2015 as part of the 2030 Agenda for Sustainable Development. The aims of the goals are to end poverty, protect the Earth, and ensure prosperity for all. Here is a brief overview of each SDG:

- a) No Poverty**
Aims to eradicate poverty by ensuring social protection, equal economic opportunities, and access to basic necessities.
- b) Zero Hunger**
Focuses on ending hunger, improving nutrition, and promoting food security worldwide.
- c) Good Health and Well-being**
Seeks to reduce maternal and child mortality, combat communicable diseases, and improve mental and physical health services.
- d) Quality Education**
Ensures inclusive and equitable education for all, focusing on literacy, numeracy, and lifelong learning opportunities.
- e) Gender Equality**
Aims to eliminate gender-based discrimination and violence, ensuring equal opportunities in all aspects of life.
- f) Clean Water and Sanitation**
Ensures access to safe and affordable drinking water, sanitation, and hygiene for all.
- g) Affordable and Clean Energy**
Promotes the use of renewable energy sources and aims for universal access to reliable, sustainable energy.
- h) Decent Work and Economic Growth**
Focuses on full employment, safe working conditions, and sustainable economic growth.
- i) Industry, Innovation, and Infrastructure**
Supports resilient infrastructure, technological advancements and sustainable industrialization.

- j) Reduced Inequalities**
Works towards reducing economic and social inequalities within and among countries.
- k) Sustainable Cities and Communities**
Aims to create safe, resilient, and sustainable urban settlements with adequate housing and transport.
- l) Responsible Consumption and Production**
Encourages sustainable resource use, waste reduction, and eco-friendly production practices.
- m) Climate Action**
Calls for urgent measures to combat climate change and its impact through mitigation and adaptation.
- n) Life Below Water**
Focuses on protecting marine life, preventing ocean pollution, and promoting sustainable fishing.
- o) Life on Land**
Aims to protect forests, combat desertification, and promote biodiversity conservation.
- p) Peace, Justice, and Strong Institutions**
Promotes peaceful societies, human rights, and accountable governance.
- q) Partnerships for the Goals**
Encourages global cooperation and partnerships for sustainable development.

These goals are interconnected and require joint efforts from governments, businesses, and individuals to achieve a sustainable future by 2030.

RQ5: What is the role of education for sustainable development?

The UN'S 2030 Agenda: Advancing Global Sustainability through Education

Sustainable Development Goals (SDGs) is introduced in 2015 by the United Nations General Assembly. It forms a global agenda consisting of 17 interconnected objectives that aim to improve the quality of life and protect the planet by 2030 as they serve as a comprehensive roadmap for achieving sustainable development by 2030. It is to be noted that SDG 4 is focused on education and explores the need to provide inclusive and equitable quality education for all, simultaneously also promoting lifelong learning opportunities. As part of this goal, Target 4.7 initiative is taken to ensure that by 2030, all learners acquire the knowledge and skills necessary to contribute to sustainable development. This includes education focused on sustainable development areas such as lifestyles, human rights, gender equality, culture of peace and nonviolence, global citizenship, and also recognizing the importance of cultural diversity in driving sustainable progress.

RQ6: What are the roles of 21st century skills for global sustainable development?

It is noteworthy that 21st century skills not only allow individuals to thrive in personal or professional lives but also contribute to the sustainable development of society from a broader perspective. The skills encompass a wide range of competencies that are essential for success in the fast-paced world. From critical thinking and problem-solving to collaboration and communication, every skill is essential for individuals to navigate the complexities of the globalized world they live in.

One of the major aspects of promoting 21st century skills for sustainable development is the recognition of the interconnectedness of the world. In today's globalized society, issues such as unemployment, poverty, and inequality are no longer confined to individual countries or regions but have significant implications that affect us all. As such, people need to be equipped with the competencies to understand and address these complex challenges in a holistic and collaborative manner.

Critical thinking is one of the foundational skills that is essential for sustainable development in the 21st century. Individuals need to be able to analyze information, evaluate arguments, and make informed decisions based on evidence and reasoning. By developing their critical thinking skills, individuals can better understand the main causes of social problems, instability and work towards finding sustainable solutions.

Problem-solving is another skill that is noteworthy for sustainable development in the 21st century. As the world addresses increasingly complex challenges, individuals need to be able to identify problems, generate creative solutions, and implement effective strategies to address them. This skill is particularly important when it comes to cases such as poverty and inequality, where innovative approaches are needed to create lasting change. By using their problem-solving skills, individuals can contribute to the development of sustainable solutions that benefit both people and the planet.

Collaboration and communication skills are important for promoting sustainable development in the 21st century. In a world that is increasingly interconnected, individuals need to be able to work effectively with others from diverse backgrounds and perspectives. By fostering a spirit of collaboration and open communication, individuals can leverage the collective expertise and resources of different stakeholders to face various challenges and create positive change. This is very important in the case of issues such as sustainable energy and resource management, where coordinated efforts are very much needed to achieve meaningful success.

In conclusion, promoting 21st century skills for sustainable development are crucial for individuals to thrive in the modern world and contribute to the well-being of society as a whole. By developing critical thinking, problem-solving, collaboration, and communication skills, individuals can address various complex challenges such as climate change, poverty, and inequality in a

holistic and effective manner in today's world and it is imperative that we equip ourselves with the competencies needed to navigate the complexities of the 21st century and create a more sustainable and thriving world for the upcoming generations.

Conclusion

To sum up, we can say that the 21st century requires a significant transformation in the skills we prioritize, with a key focus that ranges from core literacy to essential personal attributes. These competencies are not just additional features or elements but represent a fundamental paradigm shift in how we prepare individuals for success. Integrating those skills into education is vital and educators play a significant role in this perspective. Now-a-days the need for adaptability, technological proficiency and leadership represent the transformative power in the workforce. While challenges prevail, various initiatives highlight the potential and provide significant lessons. Thus, by prioritizing and focusing on these 21st century skills, we can build a more innovative, resilient and collaborative global community network equipped to face future challenges.

Acknowledgment: No

Author's Contribution: Pallabi Banerjee: Data Collection, Literature Review, Analysis, Referencing; & Dr. Mahadeb Chattopadhyay: Methodology, Analysis. Drafting

Funding: No

Declaration: All the authors have given consent for the publication.

Competing Interest: No

References

1. Atik, A K., Meeuwisse, M., Gorgievski, M J., Smeets, G. (2023). Uncovering important 21st-century skills for sustainable career development of social sciences graduates: A systematic review. *Educational Research Review*, 39, 1-15. <https://doi.org/10.1016/j.edurev.2023.100528>
2. Bell, D V J. (2016). Twenty First Century Education: Transformative Education for Sustainability and Responsible Citizenship. *Journal of Teacher Education for Sustainability*, 18 (1), 48-56. doi: 10.1186/s41239-021-00297-7
3. Garba, M., et al. (2019). Towards Achieving Sustainable Development in the 21st Century: Relevance of Innovative Instruction on Performance of Students. *International Journal of Research and Innovation in Social Science (IJRISS)*, 3(11), 180-183.
4. Mokhtar, K A E., Zerhane, R., Hammoumi, S El., Mostafa, A El. (2023). Pedagogical innovation and the development of 21st century skills and sustainable development in the teaching and learning of life and earth sciences in Morocco. *E3S Web of Conferences* 412. <https://doi.org/10.1051/e3sconf/202341201022>
5. Prakash, A. (2021). Integrating Technology in Education: Challenges and Opportunities. *International Journal of Educational Technology in Higher Education*, 18(1), 1-18.
6. Sukmanasa, E. (2023). Relevance of 21st century skills in dealing with sustainable development goals through the independent campus learning program. *Journal of Education & Teaching primary school teachers*, 6 (1), 123-128.
7. Sushma. (2022). 21st century skills: Need for sustainable development. *International Education and Research Journal*, 8 (4), 23-25.
8. Trilling, B., & Fadel, C (2009). *21st Century Skills: Learning for Life in our Times*. John Wiley & Sons. <https://www.wiley.com/en-us/21st+Century+Skills%3A+Learning+for+Life+in+Our+Times-p-9780470553916>

Publisher's Note

The Social Science Review A Multidisciplinary Journal remains neutral with regard to jurisdictional claims in published data, map and institutional affiliations.

©The Author(s) 2025. Open Access.

This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>