

Education Sustainable Development Content About System Thinking, Normative Competency, Problem Solving Competency: A Curriculum Analysis

Dr. Safia Rehmat Ullah¹, Dr. Tariq Mahmood², Dr. Muhammad Younas Mughal³

¹Government Girls High School Sham Ki Bhattian, Lahore

²Govt. High School Chicherwali, Sialkot, Punjab, Pakistan Corresponding Author:
tariq_903@hotmail.com

³S.S.T. Govt. High School No. 1 Pasrur, Sialkot

ABSTRACT

Sustainable development is crucial to the prosperity of a well-organized society. In order to ascertain the state of education sustainable development (ESD) at all three elementary levels in Punjab, Pakistan, this qualitative study was conducted. This study described the level of ESD in two areas: social studies textbooks and curricula. To accomplish the goals, a convergent design were utilized. Data was gathered through content analysis. The study's sample included elementary-level social studies texts and curricula. It has been shown that textbooks and curricula do not use the terms "sustainable" or "sustainable development." The curriculum's content analysis revealed that the elementary level's curriculum needs to be improved. The absence of sustainable development competencies and the lack of sophisticated terminology in the curriculum regarding SD were the main issues identified in the social studies textbooks and curricula of elementary level grades 6th, 7th, and 8. This study also revealed the urgent necessity for developing a curriculum that covered the finest ideas and methods for sustainability and its growth. Additionally, this report advised the Punjab government to either create an ESD social studies curriculum in line with industrialized nations' best practices or adopt international curricula's structure. The study's conclusions might be included into the revision of the primary social studies curricula. The data may be used by textbook authors to create books that emphasize ESD competencies and content. The study's findings may be used by policymakers to establish plans for implementing education for sustainable development. The results may be used by future academics to organize additional studies in the field of (ESD).

Keywords: ESD, System Thinking, Normative Competency, Problem Solving Competency

Introduction:

As human beings adopted toward the latest sustainable development era and comforts, the number of the alarming situation roused up, for example, the increasing rate of pollution, extinction in biodiversity, abnormal use of power, climate change, and distinction increased among the prospering and underprivileged population

(Martin, Dillon, Higgins, Strachan, & Vare, 2015).

Furthermore, the rate of illiteracy in backward areas has been increased, conversion of agricultural land to industrial projects is alarming too, health issues have been diversified, and the gap between the financial status of the communities has also risen (Khataybeh, Subbarini, & Shurman, 2010). These situations predict the

unwanted force of facts to be poured on the earth, resulting in unsustainable development (Khataybeh & Sakal, 2017; Purvis et al., 2019).

Various sustainability explanations frequently remain at the core of these inconsistencies, and their significance is scrutinized as difficult, questionable, and multi-confronted. Although sustainability in development can only be possible when the concerned authorities take this strategy from the theoretical stage up to the practical level, a range of difficulties will come for distraction during these steps. According to Portney and Berry (2010), training (SD) has come to mean various things to do a wide range of individuals. It most likely does like a lot to advance disarray and skepticism as specific ecological change.

Furthermore, (Hopkins & McKeown, 2005) also stated that we could not locate sustainability in our surroundings because we have no information regarding sustainable development. However, we can easily highlight unsustainability in our surrounding circumstances.

Terminology 'sustainable development' habitually utilized, yet some are misjudged and abused by an assortment of gatherings and substances in various manners (Mawhinney, 2008; McKeown & Hopkins, 2005). Although SD as a groundbreaking thought of advancement has generally perceived in many nations, their various chronicles and economies lead to multiple methods of characterizing sustainable development (Jia-bin, 2002).

Most developed countries' agenda is to maintain their per capita income at a sustainable level without destroying the natural ecosystem and environmental constituents (Elliott, 2006). On the other hand, the policy of a developing country is changed; they only focus on the empowerment of quality of life in present times without considering their future and their future generations.

Consequently, the developed countries are becoming a source of pollution that compelled the developing countries, and their ecosystems are destroying badly day by day. Furthermore, individuals in various scholarly territories express their different dreams of feasible society. Monetary teachers' eyes, "supportability is living on the intrigue," though the common freedoms network thinks that it is possible through harmony, equity, and majority rule government (Barth et al., 2015).

It was noticed by McKeown et al. (2002) that the developed countries have a depth of knowledge in ecology. World Education Report (2005) demonstrated the squander age in the United States, which deal of profoundly instructed individuals are among the most elevated on the planet. It lacks to instruct the populace to elevated levels for supporting a practical society. To improve conventional training model will perhaps keep on crushing the planet.

Ansell and Gash (2008) reported that to eradicate such abnormalities of sustainability from the education system, a new and improvised education system was introduced by the USA's educational organization in 1992. At the same time, Agenda 21 set out a proposition the main worldwide record on the portrayal of 'training for the supportable turn of events' (Rauch & Trindade, 2002). Both natural training and advancement instruction can generally be considered forerunners of ESD. Nonetheless, ESD doesn't just one of the two parts of advancement, the economy and the earth, however, investigates 'another design of natural, financial and social segments' just as the between linkages among them.

UNESCO, the UN leader, has made tremendous efforts to incorporate new agendas and strategies for sustainability. They thought that educational improvement is a powerhouse for sustainable development. It makes the

individuals adopt and struggle for a vision and quality of life that show sustainability in the present and future (UNESCO, 2005). While the lack of clarity and explicitness of this idea has been discussed (de Haan et al., 2010).

Competencies for ESD.

System thinking: Systems questioning is a technique for integration. This is based on the belief that the factor elements will response different from the device's surroundings or different parts of device. Systems are questioning units out to view structures holistically. Consistent with structures philosophy, systems thinking worries, and know-how of system by inspecting the linkages among the elements that include the device's whole (Kanapathy et al., 2020; Littledyke, Manolas, & Littledyke, 2013).

An introduction to systems thinking is provided with a brief discussion of "systems wondering" in the context of global progress. Systems thinking allows practitioners to comprehend and understand the contexts in which they operate and create programs that could adapt to circumstances on the ground. (Esquer, Manzo, Zavala, Alvarez, & Velazquez, 2012). It enables practitioners to deliver collectively many different stakeholders – particularly people with significantly exceptional backgrounds and views – to become aware of troubles and solutions to demanding situations, increasing the possibility of transformational alternate.

Start with the Making systems thinking actual additionally factors to a related – and beneficial – systems questioning animation (Bekoe & Eshun, 2013). We suggest a set of talents, a visual language, and technologies to increase our capacity to analyze structures. Finally, we provide a top-level view of numerous instructional initiatives currently showing

promise at developing a sustainability-centered gadget thinking capability, in addition to guidelines for added instructional procedures. We gift a framework of Systems Thinking as an important detail of education (Springett, 2005).

First and foremost, the guides were created to enhance student teachers' structure thinking skills, which call for the ability to resolve challenging dynamic challenges in the framework of sustainable growth. Younger people need systems thinking skills to help them understand the complexity of relationships while adhering to current sustainable development trends across the board (Schüler et al., 2018; Crocco et al., 2013).

Normative competence: The capacity to bring, observe, and negotiate sustainable values, aspirations, and objectives is known as normative competence. This encompasses the ability to identify the contemporary issue and the ability to foster a larger sustainable development. The ability to jointly map, specify, practise, reconcile, and negotiate sustainable ideals, concepts, wants, and ambitions is referred to as normative competency. The possibility for, ability to allow for, and facilitation of cooperative and participatory sustainability research and problem-solving (Allen et al., 2018; Barth et al., 2015). This is the aim of academic sustainability applications. In accordance with this paradigm, we briefly describe each skill based solely on the literature review and supporting evidence (Agbedahin, 2019; Alelaimat & Taha, 2013). The profiles provide an explanation and justification for each competency as well as representative principles and methodology (Taylor, 2014).

Problem-solving competency: One of the key capabilities that look not unusual throughout technology schooling

curriculum files is the emphasis on hassle fixing. This is frequently stated in terms of the requirement for student interaction in a particular format of problem-solving, which is frequently outlined in a layout approach. According to Johnsey (1995), there have been seventeen somewhat different ways that the design technique has been defined and diagnosed.

Curriculum Focus on ESD-Competencies

- **Systems thinking.** Systems thinking finds the connections among an organization's exceptional components – a city, a community, or a region, and ensures that they each distribute more than the sum of their parts. In today's world, we're fairly good at setting goals and then slavishly working to achieve them. But if the SDGs are to transform our entire system in the direction of sustainability, we need a considerable amount of coordinated thinking that digs deeper to address root issues. Delivering the SDGs successfully necessitates a really solid systems approach. Taking on the task requires organizations to engage on three levels: collaborating with people to obtain character goals; examining the connections between all goals; and, eventually, delivering the goals in a way that exemplifies the traits we need for a sustainable society (Beynaghi et al., 2016).
 - **Normative competence.** The ability to communicate, implement, and impart sustainability values, goals, and targets is known as normative competence. Normative competence may construct a roadmap, specify, put sustainable principles, ideas, wishes, and goals into practice, reconcile them, and negotiate them. The capacity to enable, permit, and encourage cooperative and participatory sustainability studies and problem solutions is interpersonal competency. Students should be able to design, act, and interact accordingly. This is the aim of academic sustainability applications.
 - **Problem-solving competency.** The emphasis on problem-solving is one of the important elements that appears to be present in curriculum documents for technology education. Technology educators view sustainability as a challenge that comes naturally with their role as coaches. This is a brand-new idea. Issues related to the depletion of herbal resources were formerly seen as antagonistic toward many generation instructors and a place where they felt vulnerable.
- In other words, economic expansion is always thought to be beneficial to society, and using a sustainable growth strategy is how we make sure this boom will continue. This is non-negotiable, according to the supposition that economic development is consistent and accurate. The version's character of perfect aspect repercussions is adjustable (Henderson, 1994). On the other hand, "cost trade" demands a more comprehensive approach to the problem. Many generational educators can consider themselves to have a solid understanding of technical solutions to the majority of societal issues.
- The teacher asked students to demonstrate their attitudes toward the environment in answering questions related to environmental science. How well they

perform, there is blended proof about ESD points and subjects, the public impression of student information on nations, or perspectives towards them. The educational status and strategies of the four Asian countries were evaluated critically in a report of Global Monitoring, while the subject under discussion was the environment. It was recorded as However; numerous nations conducted the direct public surveys of science, which may remember some test things for natural or maintainability issues. The social and financial fields of ESD are broadly utilized in the appraisal of public learning. It was observed that more than 66% of the 111 nations that were directed at any rate one public appraisal in 2000-1006 did as such in the sociologies (counting history, topography, community instruction) or in the sociologies. Finally, a modest bunch of nations (Kenya, Madagascar, Mauritius, Nigeria, and Morocco) make an appraisal of 'fundamental abilities' that may have some pertinence to ESD (Buckingham & Percy, 1999).

It may be concluded that the goal of the academic sustainability of the social studies programs for elementary school students is to empower them to plan, carry out responsibility. We describe the competencies of each of the brief profiles in accordance with this framework using the literature review and supporting evidence. The profiles include each competency's description and justification as it relates to social studies curricular ideas.

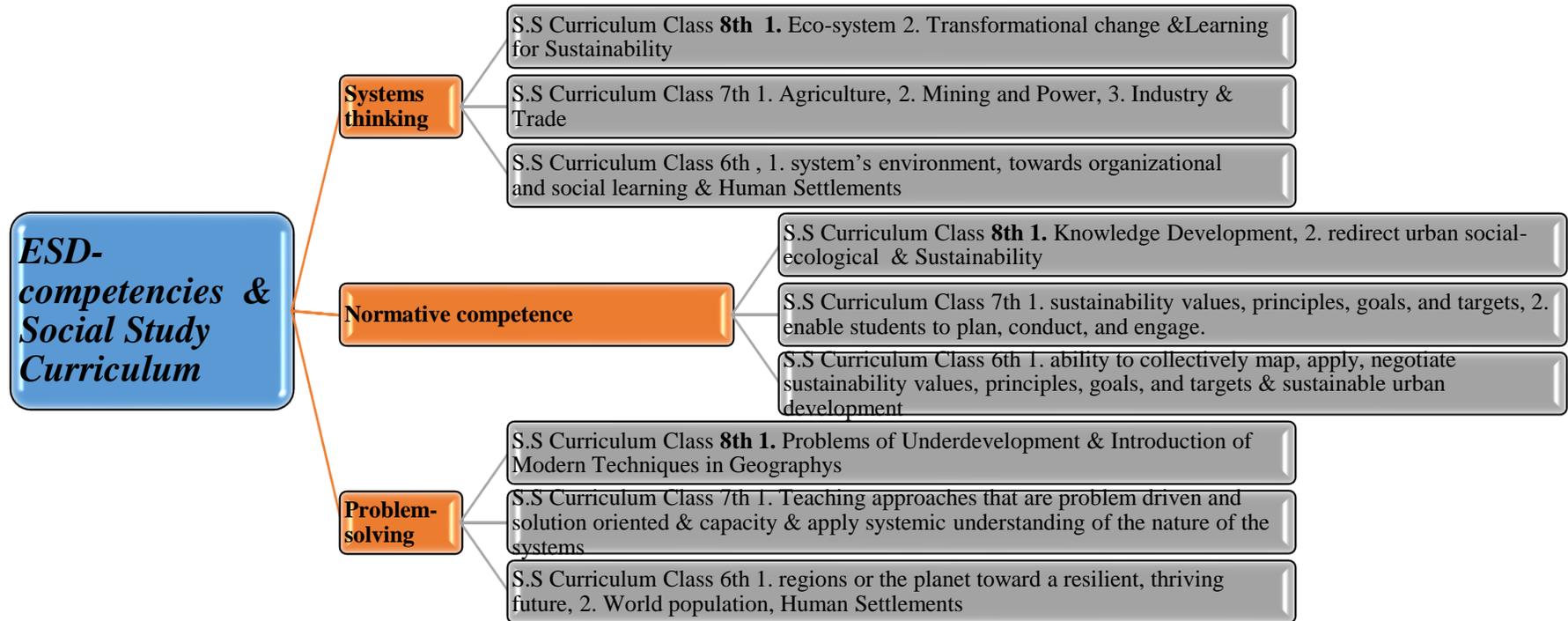


Figure I: ESD Curriculum Competencies.

In education sustainable development, systems thinking finds the connections among exceptional components of an organization – a metropolis, a society, a zone and guarantees that they distribute extra than the sum of the parts. In the present time, the world is a global village where we strive in putting our desires before anything and slavishly work to attain them. But if the SDGs are to transform our entire system in the direction of sustainability, we require a considerable amount of coordinated thinking that delves deeper to address root issues. For organizations that are up to the task, achieving the SDGs will require a truly robust systems approach, which entails working on three levels: collaborating with others to acquire character goals; examining the connections between all goals; and eventually achieving the goals in a way that exemplifies the qualities we need for a sustainable society.

The ability to communicate, integrate, and impart sustainability ideals, goals, and targets is referred to in the curriculum as normative competency. The ability to map, specify, practise, balance, and negotiate sustainable ideals, concepts, goals, and aspirations is known as normative competence. The ability, permission, and facilitation of cooperative and participatory sustainability studies and problem-solving is interpersonal competence. Academic sustainability programs aim to equip students with the systems-thinking, anticipatory, normative, strategic, and interpersonal skills necessary to design, act properly.

To engage in problem-solving based on the interaction of systems-thinking, normative thinking, and problem-solving anticipatory of social studies programs for elementary students. In accordance with this framework, we provide brief descriptions of each competency based on the literature study and supporting evidence. The profiles offer a rationale and reason for each competency that is indicative of social studies curricular principles.

Key Findings

System thinking: Social study curriculum has competences of system thinking as:

- Class 8th have competences, Eco-system, transformational change, and learning for sustainability.
- Class 7th competencies were on agriculture, mining and power, and industry with trade
- Social study Curriculum Class 6th, system's environment, towards organizational and social learning & Human Settlements

Normative competency: Social study curriculum has competences of Normative as:

- Social study Curriculum Class 8th, knowledge development, redirect urban social-ecological & Sustainability
- Social study Curriculum Class 7th, sustainability values, principles, goals, and targets, enable students to plan, conduct, and engage.
- Social study Curriculum Class 6th, ability to collectively map, apply, negotiate sustainability values, principles, goals, and targets & sustainable urban development

Problem-solving competency: Social study curriculum has competences of Problem-solving as:

- Social study Curriculum Class 8th, problems of underdevelopment & introduction of modern techniques in Geography's
- Social study Curriculum Class 7th, teaching approaches that are problem-driven and solution-oriented & capacity & apply a

systemic understanding of the nature of the systems

- Social study curriculum Class 6th, regions or the planet toward a resilient, thriving future, world population, human settlements
- To describe elementary school teachers' perceptions regarding the focus of the social studies curriculum on ESD.

These competencies meet student knowledge and social studies curriculum. These fundamental skills in sustainability aid these seemingly simple programs in developing their identities and fulfilling their educational objectives.

As a result of their connections to the framework and research on sustainability, the results help us grasp these sustainability abilities. These findings demonstrate the applicability of individual competences to one or more areas of the study using a framework for system thinking and problem solving. Both the creation of sustainability visions and the assessment of the present sustainability condition require normative competency. The competences used in the many branches of educational literature that served as the basis for this review must be made clear through excerpts.

Normative competence is the capacity to communicate, incorporate, and transfer sustainability values, goals, and targets. It is a competency found in the social study curriculum competences of education. Sustainable development systems thinking uncovers connections between exceptional components of an organization, such as a city or society. The ability to jointly map, specify, practice, reconcile, and negotiate sustainable principles, concepts, wants, and aims is known as normative competency. The emphasis on problem solving is one of the main elements that seem to be present in all curriculum materials for technology education.

This report advised the Punjab government to either create an ESD social studies curriculum in line with industrialized nations' best practices or adopt international curricula's structure. The study's conclusions might be included into the revision of the primary social studies curricula. The data may be used by textbook authors to create books that emphasize ESD competencies and content. The study's findings may be used by policymakers to establish plans for implementing education for sustainable development.

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Competences Class 6

Class	Chapter name	System thinking	Normative	Problem Solving
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6	Earth as a planet	System's environment, towards organizational and <u>social learning</u> .	Redirect urban social-ecological systems from unsustainable trajectories toward a sustainable future state.	Regions or the planet toward a resilient, thriving future.
	Earth as a home for the Human Beings	Design to programmed that can adapt as conditions on the ground change.		Nature of the systems
	Major Land Feature Land features of Pakistan World population	To identify problems and solutions to challenges, increasing the possibility of transformational change.	Ability to collectively map, specify, apply, reconcile, and negotiate sustainability values, principles, goals, and targets.	Between different parts of a system – a city, a society, a sector – and ensures they deliver more than the sum of the parts.
	Human Settlements	In today's world, we're pretty good at setting goals and then slavishly working to achieve them, the courses were developed to enhance student teachers' ability in systems thinking, which requires an ability to solve complex dynamic problems within the context of sustainable development.	Sustainable urban development. Based on new knowledge and learning, life-supporting systems.	Each community will have its own culture, set of physical assets, resident skills, and des change agents, in future.

Competences Class 7

Class	Chapter	System thinking	Normative	Problem Solving
	Physical State of the earth	Environment or other parts of the system. Systems thinking sets	Enable students to plan, conduct, and engage.	Regions or the planet toward a resilient, thriving future.

Denudation	out to view systems in a holistic manner. Can adapt as conditions on the ground change.		New ways of thinking.
Introduction to Atmosphere	Systems thinking is oriented towards organizational and <u>social learning</u> . sustainable society.	Activity our sustainability.	Teaching approaches that are problem driven and solution oriented.
Atmospheric temperature	Learning for Sustainability.	Based on new knowledge and learning.	evaluating student learning and teaching effectiveness.
Agriculture	Increasing the possibility of transformational change. interactions between different parts of a system – a city, a society, a sector.	Test and implement strategies for sustainable urban development. Enhance socio-economic activities and environmental capacities.	Thinking to public policy challenges. students expected to be future “problem solvers.” “change agents,” and “transition managers.”
Mining and power	Increasing the possibility of transformational change.	apply, reconcile, and negotiate sustainability values, principles, goals, and targets	Teaching approaches that are problem driven and solution oriented.s
Industry	Interactions between different parts of a system – a city, a society, a sector.	Edirect urban social-ecological systems from unsustainable trajectories toward a sustainable future state.	Each community will have its own. culture, set of physical assets, resident skills, and desired future.
Trade	Interactions between different parts of a system – a city, a society, a sector.	Enhance socio-economic activities and environmental capacities.	Increased capacity to build and apply systemic understanding of the nature of the systems.
Transportation	Interactions between different parts of a	Enhance socio-economic	Students expected to be future

system – a city, a society, a sector. sustainable society. activities and environmental capacities. “problem solvers.”

Competences Class 8

NO	Chapter name	System thinking	Normative	Problem Solving
1	Oceans and Seas	Environment or other parts of the system.	Redirect urban social-ecological systems from unsustainable trajectories toward a sustainable future state.	Each community will have its own culture, set of physical assets, resident skills, and desired future.
2	Big environmental problems	Environment or other parts of the system. Systems thinking sets out to view systems in a holistic manner.	Enable students to plan, conduct, and engage.	Increased capacity to build and apply systemic understanding of the nature and the systems.
3	Climate of Pakistan	Environment or other parts of the system. Systems thinking is oriented towards organizational and <u>social learning</u> . sustainable society.	Activity our sustainability.	New ways of thinking. teaching approaches that are problem driven and solution oriented.
4	Neighboring Regions of Pakistan	Learning for Sustainability.	Redirect urban social-ecological systems from unsustainable trajectories toward a sustainable future state.	Evaluating student learning and teaching effectiveness.
5	Problems of Underdevelopment	Increasing the possibility of transformational change. Interactions between different parts of a	Test and implement strategies for Sustainable urban development. enhance socio-economic activities	Thinking to public policy challenges. Students expected to be future “problem solvers,” “change agents,” and

6	Introduction of Modern Techniques in Geography's	system – a city, a society, a /sector. Increasing the possibility of transformational change. interactions between different parts of a system – a city, a society, a sector.	and environmental capacities. Apply, reconcile, and negotiate sustainability values, principles, goals, and targets.	“transition managers.” Teaching approaches that are problem driven and solution oriented.
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