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Enhancing Sustainable Development Goal Integration in Chilean Citizenship Education: A Thematic Analysis of Textbook Content and Instructional Strategies

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Abstract: This study examines the integration level of the three dimensions of the Sustainable Development Goals (SDGs) (social, economic, and environmental) in Chilean citizenship education textbooks for third and fourth grades' students in high schools, aiming to identify gaps and propose a comprehensive model for thematic instruction. Utilizing the citizenship education student textbook designed by the Faculty of Educational Sciences at the San Sebastián University in Chile, this research employs thematic analysis to assess the representation of the SDGs within the educational content. The results reveal a positive aspect: the textbooks showcase all three SDG dimensions, highlighting their potential to foster comprehensive SDG comprehension. However, the emphasis predominantly lies on social inclusion, with economic and environmental dimensions receiving less attention. This imbalance could impede the provision of holistic sustainability education, especially as critical ecological issues and certain goals (SDGs 2, 7, 12, 14, and 15) remain under-represented. The proposed thematic instruction model merges sustainability with citizenship education through concept mapping, structured lesson plans, and active collaboration, enhancing SDG literacy. This research contributes to Education for Sustainable Development (ESD) by providing a comprehensive framework that transforms sustainability education globally, cultivating knowledgeable and proactive individuals prepared to address and resolve pressing global challenges.

Keywords: Sustainable Development Goals (SDGs); Chilean citizenship education; thematic instruction model; sustainability education



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1. Introduction

The importance of sustainable development for the planet's future is fundamentally linked to public awareness and education, particularly with the approaching 2030 deadline of the United Nations' Sustainable Development Goals (SDGs). These goals promote global dignity, peace, and prosperity, with a specific focus on education through SDG 4. This goal underlines the need for inclusive, equitable quality education and lifelong learning for all, highlighting the essential role of global sustainable development awareness [1]. The integration of sustainable development within educational systems is critical, and the author of [2] emphasizes its significant impact on students' awareness and actions toward environmental, economic, and social sustainability. Furthermore, the authors of [3] point out the essential role of educators in developing informed citizens capable of making ethical and responsible decisions.

Challenges in integrating sustainable development education across all levels remain, requiring systematic approaches and practical applications to enhance student engagement [4]. Higher education institutions also play a vital role in promoting sustainability through their activities [5]. As the 2030 deadline serves as a critical call to action, Education for Sustainable Development (ESD) is acknowledged as key to achieving the SDGs,

equipping learners with the necessary knowledge and skills [6]. The link between sustainable development awareness and education is clear, necessitating intensified efforts to incorporate sustainability into educational frameworks, thereby ensuring a sustainable future [1].

Textbooks across disciplines are key in advancing Education for Sustainable Development (ESD) and raising sustainability awareness, illustrating the essential interdisciplinary approach needed to tackle global issues. Ref. [7] highlights English Language Learning textbooks in Iran as effective ESD tools, though it calls for more equitable content distribution and enhanced teacher involvement for effective discussions. This complements the author of [8]'s strategies for embedding sustainability into curricula, underlining educational materials' critical role in advancing sustainable objectives. Additionally, studies by the author of [9] on geography and the author of [10] on home economics demonstrate how various subjects aid in fostering sustainability consciousness. Ref. [11] further shows the role of EFL textbooks in developing sustainability skills, suggesting the significant contributions of language education to ESD. These findings collectively affirm the crucial function of textbooks in ESD, stressing the need for collaborative efforts among educators, curriculum designers, and policymakers to integrate sustainable development into educational materials comprehensively.

Thus, this research intends to make a significant contribution by highlighting the critical role of education in promoting sustainable development, particularly as the 2030 deadline for the United Nations' Sustainable Development Goals (SDGs) approaches. That is, integrating sustainable development into educational systems is crucial for fostering environmental, economic, and social sustainability. While the authors of [12] highlight the importance of education and training in promoting sustainable practices and preserving the planet, the authors of [13] emphasize environmental education's role in developing student awareness and responsibility. While the authors of [14] discuss educational strategies that raise public awareness about technological advancements for sustainability, the authors of [15] explore the theoretical aspects of sustainable development education, linking it to ecologically oriented economic growth. All these findings collectively justify the scientific contribution of this research and address the gap by underscoring the need for collaboration among educators, policymakers, and curriculum designers to comprehensively embed sustainability into educational frameworks, ensuring a sustainable future for all.

The inadequacy of the themes in the Sustainable Development Goals (SDGs) in educational textbooks poses significant negative impacts across various socio-demographic factors, including socio-economic status, geographic location, and cultural background. This deficiency hampers students' understanding and engagement with critical sustainability issues, leading to a lack of awareness and preparedness to address global challenges. The absence of comprehensive SDG education undermines efforts to promote equitable quality education, thereby exacerbating educational inequalities and limiting opportunities for lifelong learning, particularly for marginalized communities [16]. Additionally, without a strong foundation in SDG-related knowledge, students are less likely to develop the necessary skills and competencies to make ethical and responsible decisions, which are crucial for sustainable development [17]. This gap in education not only affects individual learners but also impedes societal progress toward achieving the United Nations' 2030 Agenda for Sustainable Development. Therefore, addressing these shortcomings by integrating SDG themes comprehensively into educational curricula is imperative to equip learners with the knowledge and skills needed for a sustainable future, thereby justifying the importance of this research [18].

Thematic instruction that merges a primary subject with the Sustainable Development Goals (SDGs) is gaining traction across educational settings. Ref. [19] demonstrates the efficacy of Project-Based Learning (PBL) in "Energy and Sustainable Development", linking projects to Agenda 2030 to boost student engagement and interdisciplinary learning. Ref. [20] illustrates how higher education institutions' SDG reports, influenced by the THE Impact Rankings, can benchmark sustainability contributions, showcasing a trend toward

embedding sustainability in academic assessments. Ref. [21] examines the cross-disciplinary integration of ESD within foreign language education in higher education, highlighting the value of embedding sustainability skills across different fields. Ref. [22] investigates Malaysia's educational transformation toward an inclusive–holistic approach, advocating for a unified “Malaysian Education” system that incorporates SDGs into a national curriculum. Ref. [23] discusses the application of Content and Language Integrated Learning (CLIL) in pharmacy education to improve cultural literacy and sustainable development through English language teaching, underscoring language's importance in interdisciplinary learning. Ref. [24] supports this collaborative, thematic educational strategy, indicating a shift toward enhancing cross-disciplinary skills and improving learning environments through integrated themes. This approach not only improves educational results but also aligns with global sustainability objectives, equipping students for contemporary challenges.

In Chile, the integration of Education for Sustainable Development (ESD) into the school curriculum remains uncharted [25]. ESD initiatives often prioritize ecopedagogy [26], focusing mainly on environmental conservation practices, which may lead to the Chilean university community's narrow interpretation of sustainability as solely environmental protection [27]. This perspective neglects the multifaceted nature of sustainable development, which includes social, economic, and environmental dimensions. Thus, scholars recommend systematic ESD implementation by harnessing its transdisciplinary potential to incorporate the Sustainable Development Goals (SDGs) across different subjects [28]. In this context, social sciences and natural sciences have been identified as having significant potential to advance ESD programs within Chilean primary education [29]. Moreover, an evaluation of the citizenship education program's guidelines indicates that secondary education's third and fourth grades offer curricular opportunities for embedding the SDGs into learning outcomes [30].

In this context, this study aims to establish the degree of representation of the SDGs' three dimensions (social, economic, and environmental) in Chilean citizenship education textbooks and propose a model of thematic instruction to teach both citizenship education and ESD (the social, economic, and environmental dimensions of the SDGs). Thus, the specific research objectives are as follows:

1. To analyze the representation of the three dimensions of the Sustainable Development Goals (social, economic, and environmental) in Chilean citizenship education textbooks;
2. To propose a model of thematic instruction that effectively integrates citizenship education and Education for Sustainable Development within the Chilean educational system.

Achieving these research objectives could enhance the holistic understanding and implementation of the SDGs, addressing the existing gap in the Chilean educational framework and contributing to a more comprehensive approach to sustainability education.

1.1. Theoretical–Conceptual Framework

The theoretical–conceptual framework of this research integrates Transformative Learning Theory, as developed by the author of [31], to analyze the incorporation of the Sustainable Development Goals (SDGs) into educational systems, particularly within citizenship education. Emphasizing critical reflection and cognitive restructuring, this framework aligns with the study's goals to facilitate comprehensive engagement with the SDGs' complex issues. It explores how citizenship education can enable students to critically evaluate and assimilate the SDGs' social, economic, and environmental dimensions into their perspectives. This approach not only aims to shift students' perceptions but also deepens their understanding of global challenges, thereby fostering critical thinking, self-reflection, and transformative learning. The theoretical–conceptual framework guides the development of a thematic instructional model that moves beyond mere information transmission, encouraging active engagement in critical thinking and problem-solving related to sustainable development. This educational strategy seeks to empower students,

promoting an informed, reflective, and proactive citizenship in line with Transformative Learning Theory [31].

1.2. Literature Review

Adopted by the United Nations Member States in 2015, the Sustainable Development Goals (SDGs) address key global challenges across social, economic, and environmental dimensions, with the aim of ensuring prosperity, peace, and environmental stewardship by 2030 [32]. Socially, the SDGs target poverty elimination, inequality reduction, and the promotion of education and social justice, notably through Goals 1 and 4, focused on poverty and quality education, respectively [32]. Economically, they seek to promote sustainable growth and decent employment, as Goal 8 emphasizes inclusive economic progress [33]. Environmentally, the goals aim to protect the planet, with Goals 13 to 15 focusing on addressing climate change and conserving land and water ecosystems [34]. Central to these efforts, Education for Sustainable Development (ESD) integrates these aspects into a unified educational strategy, equipping individuals with the necessary skills for sustainable development, as reinforced by SDG 4, Target 4.7 [32]. This integrated educational approach highlights the synergy between educational programs and global sustainability initiatives, establishing ESD as essential for achieving the SDGs and ensuring a sustainable future for all.

Civic education is integral to fostering Education for Sustainable Development (ESD) by embedding sustainability concepts into educational systems, thereby cultivating responsible global citizens. Ref. [35] highlights how higher education integrates professional and civic values, with a focus on critical thinking and experiential learning to promote sustainable practices. Ref. [36] introduces the concept of “civic compassion”, which advocates for education systems that emphasize well-being and social justice, aligning with ESD objectives. The UNESCO Decade of Education for Sustainable Development (2005–2014) emphasizes democratic principles and civic participation, essential for good governance and human rights [37]. Another author further examines how German higher education curricula integrate civic education and ESD, aligning with global sustainability goals [38]. Additionally, the author of [39] presents a model that combines social justice, environmental sustainability, economic productivity, and good governance, highlighting the role of informed global citizens in achieving sustainability. Collectively, these studies underscore the necessity of integrating civic education within ESD frameworks to enhance sustainability awareness and action.

Citizenship education in Chile aims to cultivate informed, responsible, and active citizens who can adapt to the evolving demands of a democratic society [40]. This approach emphasizes empowering individuals with the knowledge, skills, and values needed for effective participation in public life, thus fostering societal values and democratic principles. This educational model has evolved in response to Chile’s changing sociopolitical context, signifying a dedication to building a well-informed, engaged citizenry, crucial to the nation’s democracy [41].

Globally, Education for Sustainable Development (ESD) is seen as key to embedding sustainability principles in education, equipping learners to tackle global issues. In Chile, studies show ESD’s uneven integration, often skewed toward environmental aspects and lacking in a systematic approach [26,27]. Although Chilean primary education has the potential for sustainability education, it lacks explicit links between sustainability concepts and teaching methods [29]. Chile’s Citizenship Education Programme shows potential for SDG integration, yet explicit mentions are infrequent, suggesting a need for curricular improvements [30]. Proposed strategies, like Environmental Engineering Clinics, encourage active, practical learning [42]. However, challenges, such as limited teacher training and curricular advice, remain. Implementing active learning, community involvement, and interdisciplinary methods could enhance Chile’s ESD, leading to a more informed, proactive citizenry [42].

The integration of the Sustainable Development Goals (SDGs) into educational curricula is gaining momentum, aiming to equip students for complex global challenges. This

is particularly evident in citizenship education, aligning with the SDGs' focus on global citizenship and justice [43]. Interdisciplinary methods, allowing SDG exploration across subjects, enhance holistic global issue understanding, a point made clear by the authors of [44] through various case studies. In Chile, the authors of [25,42] call for clearer, more systematic SDG inclusion in secondary education and advocate for active learning strategies like project-based learning. However, challenges, such as insufficient teacher training and strict curricula, remain [45]. Addressing these issues is vital for providing students with the necessary sustainable development skills and global citizenship perspectives, highlighting the importance of innovative and interdisciplinary educational approaches for SDG integration.

Textbooks play a pivotal role in shaping curriculum and pedagogy, serving as primary vehicles for content delivery and significantly impacting educational experiences by mirroring educational standards and policies [46]. The analysis of textbook content is crucial for evaluating the integration and representation of the Sustainable Development Goals (SDGs) and Education for Sustainable Development (ESD). Despite a trend toward including sustainability themes, research by the authors of [47,48] indicates an uneven incorporation, with the focus often placed on environmental issues while neglecting social and economic aspects. In Chile, this discrepancy is evident as textbooks fail to adequately address the SDGs' interconnectedness [26]. Ref. [29] also observes a fragmented approach, emphasizing the necessity for textbooks to provide a more holistic sustainability education. The integration of SDG and ESD themes into textbooks is crucial for fostering comprehensive sustainability education, calling for collaborative efforts from educators, policymakers, and publishers to promote critical thinking and global engagement [44].

The integration of the Sustainable Development Goals (SDGs) in educational textbooks is essential for fostering sustainability awareness among students. However, the representation of economic growth, social inclusion, and environmental protection varies widely. In Indonesia, elementary school textbooks prominently feature economic activities, while Saudi Arabian science textbooks include economic topics without consistently integrating social and environmental themes, indicating a need for a more balanced approach [49]. In the UAE, fourth-grade science textbooks showed that the social dimension was the least frequently represented, highlighting a significant gap [50]. Portuguese geography and biology textbooks also insufficiently covered social risks and ethical, moral, and cultural motivations, focusing more on technological solutions [51]. Japanese EFL textbooks at the higher education level included environmental content but lacked thematic interconnectedness and did not effectively promote sustainability competencies [52]. Similarly, an evaluation of Zimbabwean secondary school mathematics textbooks found significant gaps, particularly in addressing climate change and sustainable consumption [53]. These studies highlight the necessity for textbooks to comprehensively and integratively address all dimensions of sustainable development to better prepare students for future challenges.

Hence, textbooks are fundamental in education, yet there is a clear need for more extensive inclusion of SDG and ESD themes to effectively advance transformative sustainability education.

Taking this literature into account, the following inquiries serve as the basis for the research:

1. How are the three dimensions of the Sustainable Development Goals (social, economic, and environmental) represented in Chilean citizenship education textbooks?
2. What model of thematic instruction can be proposed to effectively integrate both citizenship education and Education for Sustainable Development, encompassing the three dimensions of the SDGs, within the Chilean educational system?

Thus, the general research objective of the study is to investigate the representation of the three dimensions of the Sustainable Development Goals (social, economic, and environmental) in Chilean citizenship education textbooks and propose a model of thematic instruction that effectively integrates both citizenship education and Education for Sustainable Development within the Chilean educational system.

2. Methodology

2.1. Research Philosophy

This study is grounded in the constructivist research philosophy, which posits that reality is socially constructed and subjective. This approach is particularly suited to educational research, where understanding the diverse interpretations and implementations of curriculum content is crucial [54]. The constructivist approach allows for an in-depth exploration of how SDG themes are integrated into textbooks and perceived by educators, aligning with the qualitative nature of this study.

2.2. Source of Data for the Identification of SDG Themes

This study collected data systematically from student textbooks. We utilized two citizen education student textbooks for both the 3rd and 4th grades' students in high school, created and designed by the Faculty of Educational Sciences of the San Sebastián University in Chile. They are the country's only prescribed textbooks for citizenship education. The material is expected to help Chilean citizens navigate living and participating in a democratic country, strengthening skills such as critical and argumentative thinking so that they contribute actively and responsibly in the search for the common good. Each unit of the textbooks comprises two lessons, a unit synthesis, a unit project, and a unit assessment.

2.3. Instrumentation for Theme Identification and Analysis

Integrating thematic analysis to evaluate the representation of the Sustainable Development Goals (SDGs) in educational content begins with a thorough understanding of the diverse targets and principles encapsulated in the SDGs. Utilizing advanced PDF Content Analytical tool (AskYourPDF Research Assistant), effective for coding interpretation & thematic analysis. The tool helps in identifying and categorizing the terms into thematic areas, such as governance and environmental issues, aligning these with the broad themes of the SDGs [55]. Through the method of open coding, the tool systematically maps terms to the relevant SDGs based on thematic relevance. This distinguishes direct relationships, such as "poverty" explicitly connecting to SDG 1, from indirect relationships, like "electoral processes" supporting the broader principles of SDG 16. This detailed approach ensures a comprehensive assessment, identifying how each term influences the achievement of the SDGs with a focus on sustainability, equity, and justice [56].

The iterative process of reading and coding refines the integration of SDG themes into educational texts. This not only enhances the qualitative aspect but also quantifies the occurrence of each SDG-related term, reporting the frequency of appearances within the textbook. The quantitative dimension of this analysis is crucial, as it provides a clearer picture of the emphasis placed on each SDG within the educational material. Consequently, this approach results in a systematically compiled list of terms related to sustainability and the SDGs, reflecting a structured method for understanding and teaching sustainable development. This ensures that the thematic analysis remains grounded in the educational content's alignment with global sustainability goals while also quantifying the presence of each identified SDG term in the textbook.

Subsequently, the identified themes related to the SDGs are categorized and quantified into one of three dimensions depicted in Table 1 using SPSS version 25 [32]. This categorization not only aids in understanding the representation of each SDG but also provides a critical reflection on the depth and breadth of the SDG themes present in educational materials. The approach integrates both qualitative and quantitative analysis, offering a holistic view of how educational content aligns with the principles of sustainable development. This dual analysis ensures a robust evaluation, highlighting the strengths and areas for improvement in the representation of the SDGs in educational content. The thematic analysis of the representation of the Sustainable Development Goals (SDGs) in the educational content was conducted over a period of six weeks. This timeframe allowed for a comprehensive understanding of the varied targets and principles of the SDGs, as

well as the deployment of advanced PDF Content Analytical tools to categorize terms into thematic areas.

Table 1. SDG dimensions and corresponding numbers and goals.

SDG Dimension	SDG Number	Goal
Economic Growth	SDG 1	No Poverty
	SDG 8	Decent Work and Economic Growth
	SDG 9	Industry, Innovation, and Infrastructure
Social Inclusion	SDG 2	Zero Hunger
	SDG 3	Good Health and Well-being
	SDG 4	Quality Education
	SDG 5	Gender Equality
	SDG 10	Reduced Inequalities
	SDG 16	Peace, Justice, and Strong Institutions
	SDG 17	Partnerships for the Goals
Environmental Protection	SDG 6	Clean Water and Sanitation
	SDG 7	Affordable and Clean Energy
	SDG 11	Sustainable Cities and Communities
	SDG 12	Responsible Consumption and Production
	SDG 13	Climate Action
	SDG 14	Life Below Water
	SDG 15	Life on Land

3. Results

Table 2 presents an overview of the themes associated with the Sustainable Development Goals (SDGs), along with the frequency of each identified theme for the fourth-grade high school citizenship education textbook.

Table 2. Frequency of identified themes related to Sustainable Development Goals (SDGs) for the 4th-grade high school textbook.

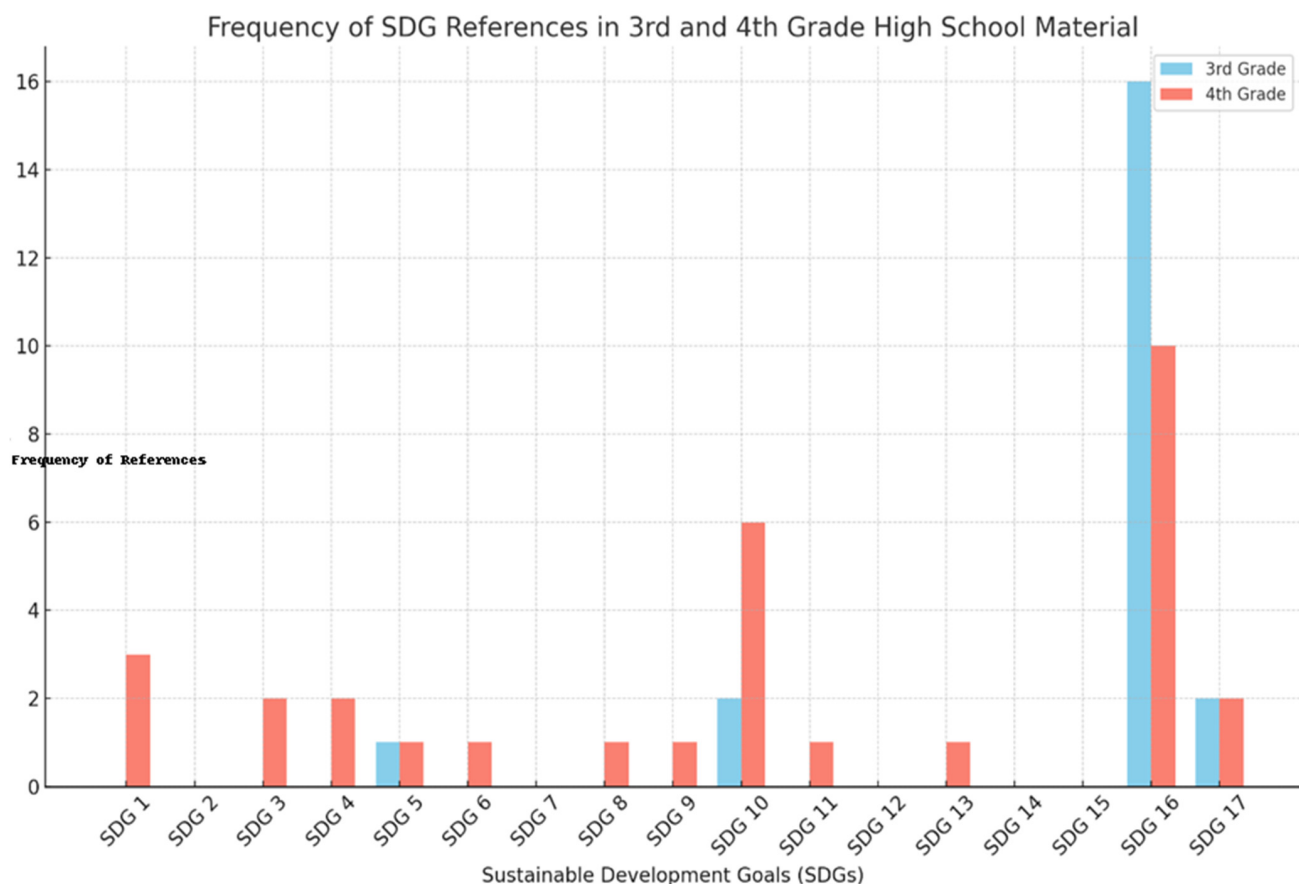
SDG Theme	Frequency	Related SDGs
Social	5	SDG 10, SDG 11, Others
Justice	6	SDG 16, All SDGs (Fairness)
Participation	3	SDG 16, Inclusive Decision-making
Climate	1	SDG 13
Inequalities	1	SDG 10
Prosperous	1	SDG 1, SDG 8, SDG 9
Equity	1	SDG 10, Fairness in Sustainability
Reducing Poverty	3	SDG 1
Health	2	SDG 3
Housing	1	SDG 11
Education	2	SDG 4
Infrastructure	1	SDG 9, SDG 11
Equality	2	SDG 5, SDG 10
Inclusion	1	SDG 10, Inclusive Societies
Civil Society	2	SDG 16, SDG 17
Human Rights	3	All SDGs, particularly SDG 10, SDG 16
Access	1	SDG 3, SDG 4, SDG 6
Transparency	1	SDG 16
Voting	2	SDG 16, Democratic Processes
Freedom	1	SDG 16, Human Rights Principles
Diversity	1	SDG 10, SDG 5

Table 3 delineates the various themes related to the Sustainable Development Goals (SDGs), accompanied by the respective frequencies at which each theme was identified in the third-grade high school citizenship education textbook.

Table 3. Frequency of identified themes related to sustainable development goals (SDGs) for the 3rd-grade high school textbook.

Theme	Frequency	Related SDGs
Democracy	6	SDG 16
Citizen Participation	2	SDG 16, Inclusive Decision-making
Democratic Society	2	SDG 16
Citizenship	1	SDG 16
Athenian Democracy	2	SDG 16 (Historical)
International Alliance	1	SDG 17
Women's Suffrage	1	SDG 5
UN General Assembly	1	SDG 16, SDG 17
Universal Declaration of Rights	1	SDG 10, SDG 16
Participatory Democracies	1	SDG 16
Representative Democracies	1	SDG 16
Electoral Processes	1	SDG 16
Pluralism	1	SDG 10, SDG 16
Civil Liberties	1	SDG 16

The bar chart below (Figure 1) depicts the frequency of the references to the Sustainable Development Goals (SDGs) in the third- and fourth-grade high school material, ranging from SDG 1 to SDG 17. The chart illustrates how often each SDG is mentioned within the context provided.

**Figure 1.** Frequency of references to Sustainable Development Goals (SDGs) in 3rd- and 4th-grade high school materials, SDG 1 to SDG 17.

The bar chart below (Figure 2) represents the frequency of references to the Sustainable Development Goals (SDGs) categorized by the three dimensions of sustainable development: economic growth, social inclusion, and environmental protection. Each dimension is

indicated along the x-axis, and the combined frequency of references from both the third- and fourth-grade high school materials is displayed along the y-axis.

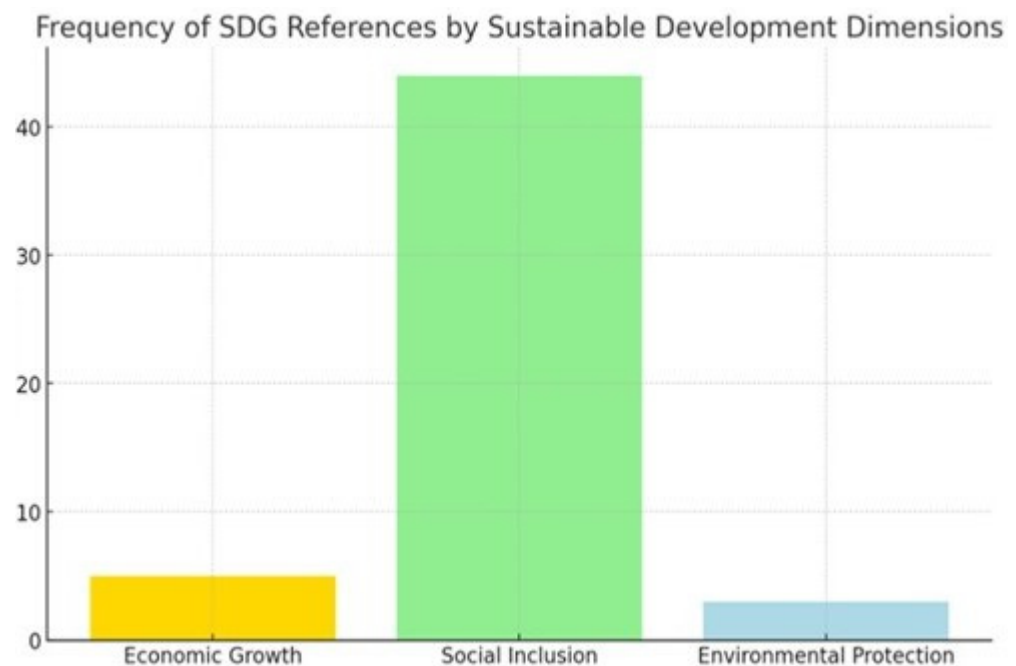


Figure 2. Frequency of references to Sustainable Development Goals (SDGs) categorized by sustainable development dimensions of economic growth, social inclusion, and environmental protection in 3rd- and 4th-grade high school materials.

Interpretation and Analysis

The findings of the thematic analysis of the third- and fourth-grade high school citizenship education textbooks in Tables 2 and 3, respectively, reveal significant insights into the representation of the Sustainable Development Goals (SDGs) within their educational content.

As shown in Table 2, the fourth-grade textbook prominently features themes of justice (six occurrences), social issues (five), and participation (three), all closely linked to SDG 16 and emphasizing fairness, inclusivity, and civic engagement. Additional themes, such as reducing poverty (three), human rights (three), equality (two), and education (two), highlight the curriculum's focus on social justice, community well-being, and quality education. The presence of diverse topics, like climate (SDG 13), health (SDG 3), and housing (SDG 11), suggests a comprehensive approach to sustainability. The frequent occurrence of these themes suggests a curriculum designed to foster awareness and action toward sustainable and equitable societies. The inclusion of diverse themes, such as reducing poverty, human rights, and equality, further broadens students' perspectives on global issues, preparing them to contribute positively to society.

On the other hand, the third-grade textbook reveals in Table 3 that democracy (six) and related themes like citizen participation (two) and democratic society (two) underscore a strong emphasis on governance and SDG 16. The inclusion of historical contexts, international alliances (SDG 17), and women's suffrage (SDG 5) broadens students' perspectives on global and gender issues. In other words, the textbook's focus on democracy and related themes indicates that students will develop a deep understanding of democratic principles and their importance in governance.

The bar chart in Figure 1 illustrates the frequency of references to the Sustainable Development Goals (SDGs) in the third- and fourth-grade high school material, with SDG 16 ("Peace, Justice, and Strong Institutions") having the highest frequency of references, indicating a strong curriculum focus on environmental sustainability and peace and justice. SDGs 1, 3, 10, and 17 are moderately referenced, suggesting a prioritization of quality education and reduced inequalities. However, SDGs 2, 7, 8, 9, 11, 12, 13, 14, and 15 are

less frequently mentioned, highlighting potential gaps in the curriculum, particularly in areas like clean energy, industry, and innovation. Differences in the frequency of references between third- and fourth-grade materials for some SDGs may reflect a progression in complexity and topic introduction as students advance in their education. To provide a comprehensive understanding of sustainable development, educators should consider a balanced integration of all SDGs, enhance the focus on the under-represented SDGs, and use context-specific examples and projects to engage students. This analysis underscores the need for a more holistic educational approach to sustainability while acknowledging the strong emphasis on certain SDGs.

The bar chart in Figure 2 demonstrates the frequency of references to the Sustainable Development Goals (SDGs) categorized by the three dimensions of sustainable development of economic growth, social inclusion, and environmental protection in third- and fourth-grade high school materials. Social inclusion has the highest frequency of references, with over 40 mentions, indicating a strong emphasis on the social aspects of sustainability in the educational materials. Economic growth is the least referenced dimension, with fewer than 10 mentions, suggesting that economic aspects receive less focus compared to social and environmental dimensions. Environmental protection has a moderate number of references, around 10, receiving more attention than economic growth but not as much as social inclusion. This emphasis on social inclusion highlights the importance of social issues such as equity, justice, and quality of life, fostering a strong sense of social responsibility among students. However, the relatively low frequency of references to economic growth indicates a potential gap in educating students about economic sustainability, which is crucial for a balanced understanding of sustainable development. Increasing the emphasis on environmental protection can help students appreciate the significance of environmental sustainability, encouraging practices that protect and preserve the environment. Educators and policymakers should strive for a holistic approach, equally emphasizing all three dimensions of sustainable development through interdisciplinary projects, examples, and discussions that integrate economic, social, and environmental perspectives. This will ensure students receive a well-rounded understanding of sustainable development.

In summary, the two textbooks effectively emphasize social inclusion and justice but under-represent economic growth and certain environmental aspects, highlighting a need for balanced SDG integration.

Thematic Instruction Model for Integrating “Sustainability” into Citizenship Education and SDG Perspectives (Figure 3):

1. Theme Introduction and Concept Mapping

Introduction Session: Begin with an introductory session where the concept of sustainability is discussed or mentioned in the context of both citizenship and the SDGs. Use visual aids, like concept maps, to show the connections between civic duties, environmental responsibilities, and the SDGs.

Textbook Alignment: Highlight sections of the citizenship textbook that relate to sustainability issues and map them to the relevant SDGs (e.g., clean water and sanitation, affordable and clean energy, and responsible consumption and production) [57];

2. Integrated Lesson Plans

Dual-focus Lessons: Design lessons that simultaneously address civic education and SDG themes. For example, a lesson could explore the role of citizens in promoting clean energy (SDG 7) and discuss civic responsibilities toward maintaining a sustainable community [58].

Activity-based Learning: Incorporate interactive activities, such as group discussions, role-playing, and project-based tasks, that encourage students to explore sustainability issues from both a civic and global perspective [59];

3. Collaborative Projects and Reflection

Sustainability Projects: Assign projects where students must identify a local sustainability issue and propose solutions that encompass both civic engagement and SDG targets.

For example, students could develop a recycling program for their school while learning about waste management policies in their community (relating to SDGs 11 and 12) [60].

Reflection and Discussion: After project completion, hold reflection sessions where students discuss what they learned about the interconnectedness of civic duties and global sustainability goals. Encourage them to reflect on how their actions can contribute to broader societal and environmental changes [61];

4. Assessment and Feedback

Integrated Assessment: Use a combination of traditional and alternative assessments (such as portfolios, presentations, and self-assessments) to evaluate students' understanding of sustainability from both civic and SDG perspectives [62].

Feedback Loop: Provide feedback that highlights students' ability to integrate and apply concepts from both areas. Encourage self-reflection and provide guidance on how to improve their understanding and application of these concepts [63].

By following this model, educators can create a cohesive learning experience that leverages a citizenship education textbook to explore sustainability through both a civic lens and in the context of the Sustainable Development Goals. This approach fosters a more holistic understanding of sustainability and encourages students to become active, informed citizens committed to achieving sustainable development.

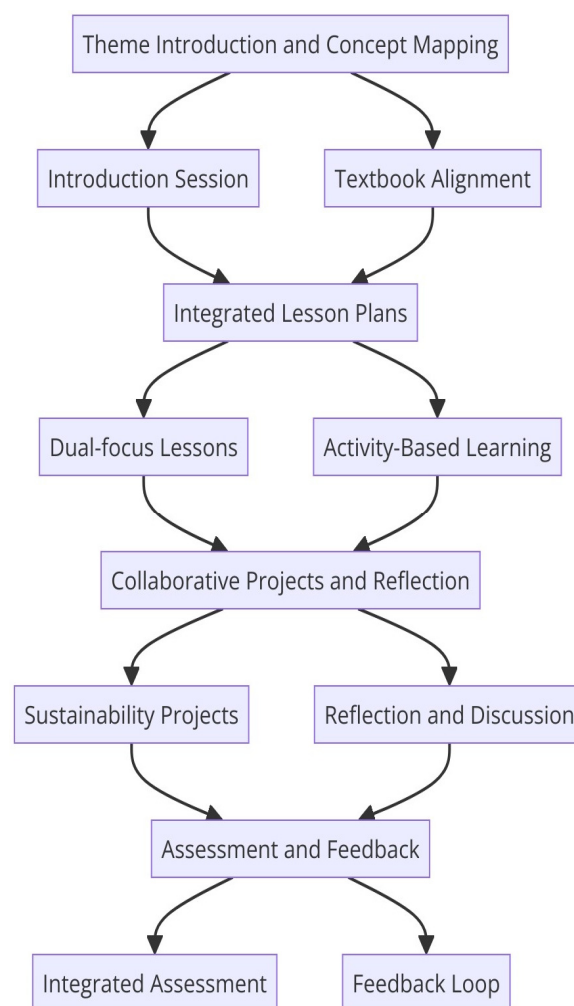


Figure 3. Thematic instruction model for integrating “Sustainability” into citizenship education and perspectives of Sustainable Development Goals (SDGs).

4. Discussion

Our research findings reveal that Chilean citizenship education textbooks for the third and fourth grades in high school effectively incorporate the three dimensions of the Sustainable Development Goals (SDGs)—social, economic, and environmental—albeit with varying degrees of emphasis. The pronounced representation of the social inclusion dimension [64] suggests a positive alignment with global educational directives aimed at fostering inclusive societies. However, the economic and environmental dimensions are less emphasized, signaling a potential area for improvement. While the presence of economic themes provides a foundational understanding, the significant under-representation of environmental sustainability [65] limits students' exposure to critical ecological challenges and solutions. Moreover, the absence of specific goals, such as SDGs 2, 7, 12, 14, and 15, highlights a missed opportunity for comprehensive SDG education [1]. This disparity underscores the necessity for a more balanced curriculum that equally addresses all three SDG dimensions to cultivate a well-rounded, sustainable development awareness among students. Therefore, our findings advocate for a strategic enhancement of Chilean citizenship education textbooks to ensure a holistic representation of the SDGs, fostering a more informed and empowered student body capable of contributing to sustainable development both locally and globally.

In response to Research Question 2, our proposed thematic instruction model seeks to integrate sustainability into the Chilean educational system by amalgamating citizenship education with the three dimensions of the Sustainable Development Goals (SDGs), thus fostering a comprehensive learning experience. Beginning with an introductory session on sustainability, we use concept mapping to visually connect civic duties, environmental responsibilities, and the SDGs, which aids in aligning textbook content directly with global sustainability targets. By designing integrated lesson plans that address both civic and SDG themes and incorporating interactive, activity-based learning, we enable students to explore sustainability issues from multiple perspectives. The model promotes collaborative projects and reflection, where students undertake sustainability projects that combine civic engagement with SDG targets, followed by sessions reflecting on the interconnectedness of local and global sustainability efforts. Through integrated assessments and a constructive feedback loop, this educational approach evaluates and enhances students' understanding of sustainability, linking it with civic responsibilities. Ultimately, this model aims to create a holistic educational pathway that empowers Chilean students to become informed, active citizens committed to sustainable development, thereby addressing the complex global challenges with a balanced, comprehensive understanding.

The thematic instruction model contributes significantly to the literature on Education for Sustainable Development (ESD) by offering a systematic framework that integrates sustainability into the Chilean educational system, thus addressing a critical gap identified in current educational practices. By initiating an introductory session on sustainability and advancing through integrated lesson plans that merge civic education with the Sustainable Development Goals (SDGs), our model fosters a multidimensional learning experience, bridging the divide between theoretical knowledge and practical application. This alignment with global sustainability targets while maintaining local relevance represents a substantial advancement beyond traditional educational methods, fulfilling the interdisciplinary framework [58]. Additionally, the emphasis on collaborative projects and reflection sessions aligns with the pedagogical strategies recommended by the author of [60], promoting experiential learning and critical thinking. The integrated assessments and feedback mechanisms proposed further reflect the dynamic and evolving nature of sustainability education [62], ensuring that students' learning remains relevant and impactful. Therefore, this model not only fills the existing gaps highlighted by the authors of [27,30] but also provides a scalable and adaptable framework for global educational contexts, making a significant contribution to the field of sustainable development education.

Furthermore, the focus of the textbooks on the social inclusion dimension aligns with the trends observed in various international contexts but also reveals critical gaps. In In-

Indonesia, elementary school textbooks prominently feature economic activities, highlighting a different imbalance where social and environmental themes are less integrated [49]. In contrast, the UAE's fourth-grade science textbooks show a significant gap in the social dimension, indicating an opposite imbalance compared to our findings [50]. In Zimbabwe, secondary school mathematics textbooks also reveal significant gaps, particularly in addressing climate change and sustainable consumption, reflecting a similar shortfall in environmental coverage as found in our study [53]. These comparative insights underscore the necessity for educational materials to comprehensively and integratively address all dimensions of sustainable development (social, economic, and environmental) to better prepare students for future challenges. While our textbooks do well in promoting social inclusion, a more balanced representation that includes economic and environmental themes is essential for fostering holistic sustainability education.

Moreover, the strong emphasis of these textbooks on social inclusion and governance aligns with findings that highlight the importance of integrating civic education within Education for Sustainable Development (ESD) frameworks to enhance sustainability awareness and action [35]. However, the noticeable imbalance, with less emphasis on economic growth and environmental protection, could limit students' comprehensive understanding of sustainable development. This educational gap impedes progress toward achieving the United Nations' 2030 Agenda for Sustainable Development, as a strong foundation in SDG-related knowledge is crucial for developing the skills needed for ethical and responsible decision-making [17]. Addressing these shortcomings by comprehensively integrating SDG themes into educational curricula is imperative for preparing students to meet future sustainability challenges and contribute positively to societal progress [18].

Transformative Learning Theory, as developed by the author of [31], underpins our research findings, emphasizing the importance of critical reflection and cognitive restructuring in learners, which is crucial for understanding the integration of the Sustainable Development Goals (SDGs) into Chilean citizenship education textbooks. Consequently, this theoretical-conceptual framework elucidates why the observed discrepancy in the representation of SDG dimensions—primarily the underemphasis on economic and environmental aspects compared to the social dimension—potentially hinders students' comprehensive engagement with sustainable development issues. Moreover, Transformative Learning Theory reinforces the rationale behind our proposed thematic instruction model, which seeks to amalgamate citizenship education with the SDGs, thereby fostering a more holistic educational experience. By promoting critical thinking and problem-solving related to sustainable development, this model aligns with the transformative educational goals, aiming to cultivate a more informed, reflective, and active citizenship. Hence, the theory's focus on transformative learning processes justifies the necessity for an integrated approach in educational content and strategies, underscoring the importance of equally addressing all three SDG dimensions to facilitate a balanced and comprehensive understanding of sustainable development among students, ultimately contributing to a more sustainable and informed global society.

Finally, Chilean teachers and policymakers are urged to strategically enhance the citizenship education curriculum to ensure a more balanced representation of the Sustainable Development Goals (SDGs), particularly addressing the under-represented economic and environmental dimensions alongside the well-covered social inclusion aspect. Policymakers are advised to revise the curriculum to incorporate the missing themes, such as SDGs 2, 7, 12, 14, and 15, as detailed in Tables 1 and 2, thereby creating a holistic educational framework [7]. Concurrently, teachers should pursue continuous professional development focused on these SDGs, enhancing their instructional capabilities and integrating active, interactive learning strategies that encourage student engagement with all three SDG dimensions [66]. Additionally, the allocation of adequate resources and materials will support the effective teaching of these themes, while fostering community partnerships can offer students practical, real-world experiences, enhancing their understanding and commitment to sustainable development [67]. Lastly, regular assessment and feedback

mechanisms should be established to monitor and refine the effectiveness of the SDG-integrated curriculum and teaching practices, ensuring they meet educational objectives and remain relevant to students' learning experiences [63]. By collectively implementing these recommendations, the educational stakeholders in Chile can significantly advance SDG education, equipping students with the knowledge and skills necessary to contribute to sustainable development both locally and globally.

5. Limitations and Future Research

However, the study's methodology, primarily reliant on thematic analysis, presents limitations in capturing the full complexity of textbook content and classroom application and is further constrained by its scope, which is limited to a single educational institution's textbooks. Future research should, therefore, be expanded to encompass a broader range of educational materials and contexts, potentially through quantitative studies and longitudinal assessments, to evaluate the model's effectiveness and its long-term impact on sustainability education, thereby contributing to a more holistic and effective approach globally. Lastly, future research should explore the development and impact of supplementary educational materials and teacher training programs designed to enhance the balanced integration of economic and environmental dimensions alongside social inclusion in citizenship education curricula.

6. Conclusions

This study critically examined the integration of the Sustainable Development Goals (SDGs) and their social, economic, and environmental dimensions in Chilean citizenship education textbooks for high school juniors and seniors, employing a thematic analysis for an educational content assessment. While the analysis highlighted a commendable inclusion of the three SDG dimensions underscoring the textbooks' potential to foster comprehensive understanding, it also revealed a pronounced imbalance, predominantly favoring social inclusion over economic and environmental aspects. Consequently, this could limit holistic engagement with sustainability, particularly given the under-representation of critical ecological issues and specific SDGs. In response, the proposed thematic instruction model represents a promising avenue for integrating comprehensive SDG education within citizenship education, aiming to provide a balanced and immersive learning experience through concept mapping, integrated lesson plans, and collaborative activities. Moreover, the findings indicate that effective SDG education requires enhanced teacher training and curriculum development to equally emphasize social, economic, and environmental sustainability. Addressing these gaps will enable educational institutions to better prepare students for global challenges. This balanced approach enriches learning experiences, aligns educational practices with global sustainability goals, and fosters informed, proactive citizens. Integrating comprehensive SDG models in education can significantly contribute to sustainable development, positioning education as a catalyst for positive societal change.

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