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Evaluation of Special Education Turkish Textbooks in Interdisciplinary Context

Disiplinlerarası Bağlamda Özel Eğitim Türkçe Ders Kitaplarının Değerlendirilmesi

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Abstract: This study examines interdisciplinary integration in Turkish language textbooks prepared for primary-level (grades 1–4) special education students in Turkey. The research was conducted using a quantitative content analysis design based on Klein's (2010) classification of interdisciplinarity. The Special Education Turkish Textbooks 1 and 2, published by the Ministry of National Education, were coded under eight disciplinary categories: Mathematics, Science, Life Studies, Social Studies, Physical Education and Sports, Visual Arts, Music, and Other/Turkish. All content meeting the analysis criteria was examined using a full-count approach. A total of 580 analysis units and 893 disciplinary assignments were included. Inter-coder reliability was calculated for 117 units, and Cohen's Kappa coefficient was found to be 0.88. The findings indicate that when formal Turkish codes are excluded, Life Studies represents the most frequently referenced content discipline, comprising 32.3% of total assignments, while Mathematics (0.4%) and Music (0%) are extremely limited or not represented at all. Actual interdisciplinary integration at the content level was identified in only 5.5% of the analysis units and occurred at a level approximately 3.6 times higher in narrative texts than in activities. Additionally, while Social Studies and Physical Education and Sports exhibited the highest integration rates, Life Studies, despite being the most frequently represented discipline, had the lowest integration rate. The findings show that although the Türkiye Yüzyılı Maarif Model adopts interdisciplinary integration as a fundamental curriculum principle, this principle is reflected in the Turkish textbooks prepared for students with moderate to severe intellectual disabilities and autism spectrum disorder in a limited and imbalanced manner. This study provides some of the first systematic evidence of the quantitative profile of interdisciplinary integration in special education textbooks and highlights the importance of empirically assessing the extent to which interdisciplinary principles adopted in curricula are reflected in instructional materials.

Keywords: Special education, Turkish textbooks, interdisciplinary teaching, Türkiye Century Maarif Model (TCMM)

Özet: Bu çalışma, Türkiye'de ilkokul düzeyindeki (1–4. sınıf) özel eğitim öğrencileri için hazırlanan Türkçe ders kitaplarında disiplinlerarası bütünleştirmenin durumunu incelemektedir. Araştırma, Klein'ın (2010) disiplinlerarasılık sınıflandırmasına dayalı nicel içerik analizi deseni kullanılarak yürütülmüştür. Millî Eğitim Bakanlığı tarafından yayımlanan Özel Eğitim Türkçe 1 ve Türkçe 2 Ders Kitapları, Matematik, Fen Bilimleri, Hayat Bilgisi, Sosyal Bilgiler, Beden Eğitimi ve Spor, Görsel Sanatlar, Müzik ve Diğer/Türkçe olmak üzere sekiz disiplin kategorisi altında kodlanmıştır. Analiz ölçütlerini karşılayan tüm içerikler tam sayım yaklaşımıyla incelenmiştir. Araştırmada toplam 580 analiz birimi ve 893 disiplin ataması değerlendirilmiştir. Kodlayıcılar arası güvenirlik 117 analiz birimi üzerinden hesaplanmış ve Cohen's Kappa katsayısı 0,88 olarak bulunmuştur. Bulgular, biçimsel Türkçe kodları analiz dışı bırakıldığında, Hayat Bilgisi disiplininin toplam atamaların %32,3'ünü oluşturarak en sık başvurulan içerik disiplini olduğunu; buna karşın Matematik (%0,4) ve Müzik (%0) disiplinlerinin son derece sınırlı düzeyde temsil edildiğini ya da hiç yer almadığını göstermektedir. İçerik düzeyinde gerçek anlamda disiplinlerarası bütünleştirme yalnızca analiz birimlerinin %5,5'inde belirlenmiş ve bu bütünleştirmenin anlatı metinlerinde etkinliklere göre yaklaşık 3,6 kat daha fazla olduğu saptanmıştır. Ayrıca, Sosyal Bilgiler ile Beden Eğitimi ve Spor disiplinleri en yüksek bütünleştirme oranlarına sahipken, en sık temsil edilen disiplin olmasına rağmen Hayat Bilgisi en düşük bütünleştirme oranını göstermiştir. Elde edilen bulgular, Türkiye Yüzyılı Maarif Modeli disiplinlerarası bütünleştirmeyi temel bir öğretim programı ilkesi olarak benimsemesine rağmen, bu ilkenin orta-ağır düzeyde zihinsel yetersizliği ve otizm spektrum bozukluğu bulunan öğrenciler için hazırlanan Türkçe ders kitaplarına sınırlı ve dengesiz bir biçimde yansıdığını ortaya koymaktadır. Bu çalışma, özel eğitim ders kitaplarındaki disiplinlerarası bütünleştirmenin nicel görünümüne ilişkin ilk sistematik kanıtlardan bazılarını sunmakta ve öğretim programlarında benimsenen disiplinlerarası ilkelerin öğretim materyallerine ne ölçüde yansıdığının ampirik olarak değerlendirilmesinin önemini vurgulamaktadır.

Anahtar Kelimeler: Özel eğitim, Türkçe ders kitapları, disiplinlerarası öğretim, Türkiye Yüzyılı Maarif Modeli

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1. Introduction

The question of how school disciplines should relate to one another in the curriculum has occupied curriculum scholars for decades, and the field has produced no settled answer. Jacobs (1989, p. 8) offered an early and widely cited definition, describing interdisciplinarity as "a knowledge view and curricular approach that consciously applies methodology and language from more than one discipline to examine a central theme, issue, problem, topic, or experience." Klein (2010) later situated this approach within a broader taxonomy. In her account, multidisciplinary work juxtaposes, sequences, and coordinates disciplinary contributions but does not necessarily integrate them. Interdisciplinary work integrates, links, and blends various subject areas. Transdisciplinary work rests on a common system of axioms that transcends the narrow scope of disciplinary worldviews through an overarching synthesis of knowledge. The present study operates at the interdisciplinary level of this taxonomy. It does not ask how axiomatic syntheses are built or how subjects are loosely coordinated, but how Turkish textbooks for special education draw on and link other school disciplines.

Contemporary discussions on curriculum integration have largely revolved around two complementary yet conceptually distinct traditions. Beane (1995, 1997) advocates a transformative perspective, arguing that the curriculum should be organized around significant personal and social issues rather than conventional subject boundaries. From this perspective, integration is viewed as a process that transcends disciplinary structures rather than merely reorganizing them. In contrast, Drake and Burns (2004) proposed an integration model that preserves disciplinary standards while promoting coherence across them through the KNOW, DO, BE framework, which aligns disciplinary knowledge, skills, and values within a common curricular structure. Thus, although both perspectives emphasize the importance of connecting disciplines, they differ primarily in their assumptions regarding the role of curriculum standards in achieving integration in curriculum design. Complementing these curriculum-oriented perspectives, Boix Mansilla (2005, p. 16) conceptualizes interdisciplinary understanding from a cognitive perspective as the capacity to integrate knowledge across disciplines in ways that generate cognitive advancement. This conceptualization was subsequently operationalized by Boix Mansilla and Dawes Duraisingh (2007, pp. 216-217) into an assessment framework comprising three interrelated dimensions: disciplinary grounding, advancement through integration, and critical awareness. While these theoretical frameworks have substantially informed interdisciplinary curriculum research in general education, the extent to which their underlying assumptions and analytical categories are applicable to instructional materials developed for special education, particularly for students with moderate and severe disabilities, remains an open question.

The theoretical perspectives outlined above have extended beyond conceptual discussions and increasingly influenced curriculum policy and educational reform. Their shared premise - that certain forms of knowledge are more effectively developed through connections across disciplinary boundaries than within isolated disciplines - has become a prominent principle in contemporary curriculum design. Consequently, interdisciplinary integration emerged as a key objective of many national curriculum reforms in the 2010s (Voogt & Roblin, 2012), although its implementation has varied considerably across educational systems. For example, Finland embedded interdisciplinary learning through its National Core Curriculum, approved in 2014 and implemented in 2016, by introducing seven transversal competences across all subject areas and requiring every school to implement at least one multidisciplinary learning module each academic year (Finnish National Agency for Education, 2016; Halinen, 2018; Lavonen, 2020). Turkey adopted a different policy

trajectory through the Türkiye Century Maarif Model (TCMM), for which the Ministry of National Education released draft curricula for public consultation in April 2024 and initiated phased implementation during the 2024 and 2025 academic years, beginning with preschool, Grade 1, Grade 5, and Grade 9 (Ministry of National Education [MoNE], 2024). The model conceptualizes curriculum reform as a holistic educational approach structured around four interrelated components: the basic approach of the curriculum programs, a student profile, a Virtue, Value, Action Framework, and a Skills Framework (MoNE, 2024, p. 3).

Despite the comprehensive conceptual framework proposed by the model, independent policy analyses have provided more critical evaluations. Sever (2024) argues that the conceptual ambiguities embedded in the model may lead to inconsistencies between educational theory and practice, creating interpretative challenges for practitioners. Similarly, the Turkish Education Association Think Tank (TEDMEM) (2024) has drawn attention to several concerns regarding the clarity and coherence of the draft curriculum documents. Similarly, a systematic review conducted by Kadirhan and Şat (2025), which examined 87 peer-reviewed studies on the TCMM published between 2024 and 2025, found that existing research has primarily focused on curriculum structure, values education, teacher and stakeholder perspectives, 21st-century skills, and assessment and evaluation. Taken together, the thematic distribution of these studies suggests that the interdisciplinary dimension of the TCMM has not yet been sufficiently investigated within the context of special education.

A clearer answer requires examining how special education research has reconceptualized academic content in the past two decades. While special education curricula were once primarily associated with functional and life-skills instruction, contemporary scholarship increasingly emphasizes systematic engagement with academic domains, including reading, writing, mathematics, science, and social studies, through standards-based individualized educational programs (Browder & Spooner, 2011). Complementing this curricular shift, Universal Design for Learning (UDL) extends the discussion from curriculum content to instructional design. Meyer, Rose and Gordon (2014) argue that learning materials should be designed from the outset to accommodate learner variability by providing multiple means of engagement, representation, and action and expression, rather than relying on retrospective adaptations. Despite these developments, relatively little attention has been paid to how interdisciplinary integration is reflected in instructional materials developed specifically for students with moderate and severe disabilities. Turkey provides an appropriate context for addressing these questions. The Directorate General of Special Education and Guidance Services of the Ministry of National Education develops a comprehensive textbook series for special education across preschool and three subsequent educational stages, with the Turkish language being one of the subjects supported by dedicated textbooks at the school stages (MoNE, 2025). According to the official curriculum, these materials are intended for students with moderate-to-severe intellectual disabilities and autism spectrum disorder (MoNE, 2018). Existing studies have examined issues such as activity design for students with hearing impairments (Doğru et al., 2020) and the distribution of question types in second-stage Turkish textbooks (Çetinkaya, 2022). However, the interdisciplinary dimension of these instructional materials remains largely unexamined.

1.1. Aim

This study addresses this gap by examining interdisciplinary integration in the Turkish context. Specifically, it investigates how the first school-stage Reading-Writing Course textbooks, published in the Ministry of National Education's catalogue as the Türkçe (Turkish) series for Grades 1 to 4, establish connections with other school disciplines. These

textbooks are produced by the Ministry of National Education for the educational stage in which foundational reading and writing skills are developed, and Turkish is positioned in the TCMM as a shared curricular objective across subject areas (MoNE, 2024, p. 4). According to the official curriculum, the textbooks are intended for students with moderate-to-severe intellectual disabilities and autism spectrum disorder (MoNE, 2018). Accordingly, this study addresses the following research questions

1.2. Research Questions

RQ1. Which disciplines are referenced in the Turkish series texts, and how frequently do these references occur?

RQ2. What interdisciplinary references are reflected in the activities and preparatory tasks, and how do these patterns compare with those identified in the texts?

RQ3. In which learning areas are these interdisciplinary references concentrated, and which learning areas demonstrate limited or no interdisciplinary integration?

RQ4. To what extent do the identified patterns reflect the integrative principles articulated in the TCMM?

2. Methodology

2.1. Research model

This study was designed using a quantitative content analysis method. Quantitative content analysis is a research technique based on the systematic and replicable coding of textual content into predefined categories (Krippendorff, 2019). Neuendorf (2017) defines quantitative content analysis as a technique that classifies the systematic, objective and quantitative characteristics of texts or other meaningful content, based on coding rules. In this study, the deductive coding variant of quantitative content analysis was used. This variant involves deriving the coding scheme a priori from the theoretical framework and systematically applying it to the data (Hsieh & Shannon, 2005). The coding process followed Mayring's (2014) structured quantitative content analysis procedure, which consists of the construction of the category system, pilot study, main coding, and reliability assessment phases. The conceptual framework of this study is based on Klein's (2010) taxonomy of interdisciplinary integration. This framework classifies interdisciplinary relationships into three levels — multidisciplinarity, interdisciplinarity and transdisciplinarity — and provides an operational basis for coding disciplinary references in textbook analyses. Additionally, Boix Mansilla's (2005) criteria for assessing interdisciplinary work and Beane's (1997) curriculum integration model were used as complementary theoretical foundations for this study.

2.2. Materials

2.2.1. Sampling Frame

The materials of the study are the Primary Stage (Grades 1–4) Special Education Turkish Textbook 1 and Textbook 2, published in 2025 by the General Directorate of Special Education and Guidance Services of the Turkish Ministry of National Education (MoNE, 2025). The textbooks were prepared within the framework of the TCMM (MoNE, 2024). The TCMM is a newly restructured curriculum model of the Turkish education system, which lists interdisciplinary connections and a holistic educational approach among its fundamental principles. Textbook 1 had a total length of 120 pages, with activity pages ranging from pages 8 to 115 (108 activity pages). Textbook 2 has a total length of 142 pages,

with activity pages ranging from pages 13 to 140 (128 activity pages). Both textbooks were prepared by the same publisher (MoNE) for the same target audience (special education Grades 1–4 students). The homogeneity of the sampling frame meets the precondition for a within-corpus comparative analysis design in the content analysis (Krippendorff, 2019).

2.2.2. Sampling Method

A census approach was adopted in this study. As defined by Krippendorff (2019), a census refers to the inclusion of an entire corpus in an analysis. When preferred over purposive or random sampling, this approach demonstrates that research findings have population-level validity. In this study, all activity pages in both textbooks were included in the analysis. Only pages that did not meet the textual identifiability criterion (visual-only student-generated activities and cut-out card reprints) were excluded from the analysis.

2.3. Coding Scheme and Procedure

2.3.1. Unit of Analysis

A sentence-level unit of analysis was adopted. Neuendorf (2017) emphasizes that the unit of analysis can be determined at the word, sentence, paragraph, character, or theme level, and recommends sentence-level coding for analyzing textbooks. In this study, a sentence was defined as a completed unit of meaning in the textbook, separated by punctuation marks. However, connected mini-stories (sequences of three to four sentences) were coded as a single contextual unit. This distinction aligns with Krippendorff's (2019) definition of a contextual unit and preserves the story-level integrity of the reading texts.

2.3.2. Three Component Types

The textbook content is divided into three component types: (a) Text: reading passages, connected mini-stories, and stories; (b) Preparation: guiding sentences and prompting expressions provided before writing activities; and (c) Activity: multiple-choice questions, open-ended questions, sentence generation, sentence correction, and correct sentence selection tasks. This distinction reflects the functional differences in the textbook and supports the methodological separation between reading comprehension and production-oriented activities (Schreier, 2012). Although Preparation was defined a priori as a structural component type based on the textbook design, no units meeting this criterion were identified in either textbook (0 units in Textbook 1 and Textbook 2); consequently, all coded units were classified as either Text or Activity.

2.3.3. Coding Scheme

The coding scheme is based on the core subjects of the Grade 1–4 primary curriculum of the Ministry of National Education (MoNE, 2018): Mathematics (MAT), Science (SCI), Life Studies (LIF), Social Studies (SOC), Physical Education and Sports (PES), Visual Arts (VA), Music (MUS), and Other/Turkish (OTH). The OTH category covered Turkish reading-comprehension acquisitions and sentences without any disciplinary reference. The coding scheme was constructed a priori using Schreier's (2012) concept-driven categories approach and refined through pilot application. Operational definitions and inclusion/exclusion criteria were developed for each discipline, consistent with Neuendorf's (2017) principle of a priori mutually exclusive and exhaustive coding schemes.

2.3.4. Multiple Coding Rule

For each unit of analysis, primary, secondary, and tertiary discipline attributions were coded as follows: the dominant disciplinary attribution of a sentence was primary and clear but secondary attributions were listed in the secondary and tertiary columns. This approach is based on the multi-code coding procedure applied in cases where a sentence may have more than one disciplinary attribution (Mayring, 2014). Dual coding was systematically applied, particularly in two cases: (a) interrogative sentences are coded both in terms of form (OTH - Turkish reading-comprehension attainment) and content (disciplinary attribution of the question topic); (b) sentences bearing multiple clear disciplinary references are coded with a secondary discipline in addition to the dominant discipline.

2.3.5. Coding Decision Log

A coding decision log documenting the boundary cases encountered during the coding process and the methodological decisions made was systematically maintained. The decisions were structured into five functional groups: (a) determining disciplinary attribution thresholds, (b) defining binary coding rules based on form and content, (c) standardizing the unit of analysis and preventing data duplication, (d) classifying the components of text, preparation, and activity, and (e) consistently resolving instances of interdisciplinary overlap. Krippendorff (2019) states that such a coding decision log is a fundamental component of intercoder reliability. This approach also creates an audit trail that supports transparency, auditability, and replicability in content analysis (Neuendorf, 2017). The detailed coding decision log is shared on OSF as open access on OSF (https://doi.org/10.17605/OSF.IO/MZY3C).

2.3.6. Five Operational Principles

Principle 1 (Dual Coding): Question sentences are dual-coded by both form (DGR) and content (relevant discipline). This principle was formalized on the basis of Decision 2 (the reference decision).

Principle 2 (Manifest Content): Only the content explicitly present in the sentence is coded; no coding based on implicit inferences (Krippendorff, 2019).

Principle 3 (Curriculum Scope): Advanced concepts not included in the Grade 1–4 curriculum are not coded as disciplinary references (MoNE, 2018).

Principle 4 (Ordinary Language vs Technical Term): A word is not coded simply because it appears in the scheme; it must be used in its technical sense. Idiomatic expressions are excluded from the operational definition.

Principle 5 (Semantic Unit): If the same semantic content is presented in different syntactic structures, it is counted as a single unit of analysis. This prevents data inflation.

2.3.7. Non-coding Pages

The following types of pages were excluded from the analysis: (a) pages containing only visual content (student-produced sequencing activities, blank writing spaces); (b) cut-out card pages that are physical reprints of previous text pages; and (c) 'Copying by looking' activities (copying the same text). This exclusion is based on Krippendorff's (2019) principles of textual identifiability and semantic units. In Book 1, 24 pages (19 visual only + 5 cut-out card reprints) and in Book 2, 11 pages (copying the same text by looking) were excluded from the analysis.

2.4. Inter-Rater Reliability

Procedure: Two coders participated in the calculation of the inter-rater reliability. The first coder was the researcher (an assistant professor in the Department of Special Education). The second coder was an independent academic with a doctorate in special education. The second coder was briefed using documentation including the coding schema, decision log, operational principles, and boundary case rules, and then performed primary discipline coding under blind conditions; the coding list included only unit number, component type, and sentence/question text, and the first coder's codes were never visible at any stage. This procedure conforms to the blind independent coding principle defined by Hayes and Krippendorff (2007).

Subsample: For the reliability calculation, a subsample of 117 units was selected from the total dataset using stratified random sampling (~20.2% of the current corpus under analysis). Stratification was proportional to the intersection of book (Book 1 / Book 2) and component type (Text/Activity), ensuring that the subsample reflected the internal distribution of the corpus. This proportion meets the minimum 20% threshold recommended by Neuendorf (2017) and aligns with the principle of stratified sampling described by Krippendorff (2019).

Reliability coefficient: Inter-rater reliability was calculated using Cohen's kappa coefficient (McHugh, 2012). As a result of the analysis, observed agreement (Po) = 0.9316 (93.16%), expected agreement (Pe) = 0.4379, and Cohen's Kappa coefficient $\kappa = 0.88$. According to Landis and Koch (1977), this value falls within the "almost perfect agreement" range (0.81–1.00); according to McHugh (2012), it likewise corresponds to the almost perfect category. Discrepancy analysis: Disagreement between the two coders was observed in 8 out of 117 units (6.84%). The discrepancies clustered in two patterns: (1) boundary cases between OTH (formal Turkish code) and content discipline (n = 5); (2) animal movement/color-pattern boundary cases (n = 3). Notably, these same two boundaries correspond to the most frequently observed content-content combination identified in the Results section (SCI + VA; see Table 5), indicating that the disagreements were concentrated at systematic boundary regions rather than occurring randomly. The methodological and theoretical implications of this convergence are examined in Section 4.4.

2.5. Validity Strategies

The content validity of the coding scheme was ensured in three ways: (a) establishing the discipline categories based on the MoNE (2018) primary curriculum; (b) refining the scheme through a pilot study; and (c) reviewing the scheme with expert opinion. Schreier (2012) presents this approach as the standard for content validity. Procedural validity was ensured by systematic documentation of the coding decision log. Neuendorf (2017) defines this approach as meeting the criteria of replication and transparency. During the coding scheme's integrity audit, two consistency corrections were documented; these corrections will be publicly available along with the post-publication dataset. The methodological limitations of this study are as follows: (a) the study was conducted in a single language (Turkish), within a single curriculum model (TCMM), and at a single educational level (special education primary level); generalization of findings to international and different-level curricula requires additional studies; (b) the unit of analysis was determined as sentence-level; discourse- or paragraph-level analyses may provide complementary findings; (c) the research is a static document analysis; in-class use of these textbooks and teacher-mediated effects are outside the scope.

3. Results

3.1. Findings for RQ1

Table 1 presents the primary discipline code distribution across the corpus (Textbook 1: n = 269 coded units; Textbook 2: n = 311 coded units).

Table 1

Distribution of Primary Discipline Codes

Discipline	Textbook 1 (n=269)	Textbook 2 (n=311)	Total (n=580)
OTH	108 (40.1%)	283 (91.0%)	391 (67.4%)
LIF	87 (32.3%)	18 (5.8%)	105 (18.1%)
SCI	33 (12.3%)	5 (1.6%)	38 (6.6%)
VA	13 (4.8%)	4 (1.3%)	17 (2.9%)
PES	13 (4.8%)	0 (0%)	13 (2.2%)
SOC	12 (4.5%)	1 (0.3%)	13 (2.2%)
MAT	3 (1.1%)	0 (0%)	3 (0.5%)
MUS	0 (0%)	0 (0%)	0 (0%)

The elevated OTH share in Textbook 2 (91.0%) reflects the form/content dual-coding convention (Decision 2) applied to activity questions rather than a substantive difference in content. When all attributions (primary, secondary, tertiary; n = 893) are counted, thereby capturing content disciplines coded as secondary to OTH, the distribution changes substantially (see Table 2).

Table 2

Total Discipline Attribution Frequency

Discipline	Attributions	%
OTH	391	43.8%
LIF	288	32.3%
SCI	83	9.3%
VA	83	9.3%
SOC	24	2.7%
PES	20	2.2%
MAT	4	0.4%
MUS	0	0%

Excluding OTH, Life Studies (LIF) was the most frequently referenced content discipline (32.3% of all attributions), followed by Science (SCI) and Visual Arts (VA), tied at 9.3%. Mathematics (0.4%) and music (0%) were referenced negligibly and not at all, respectively.

3.2. Findings for RQ2

Table 3

Primary Discipline by Component Type

Discipline	Text (n=82)	Activity (n=498)
LIF	50 (61.0%)	55 (11.0%)
SCI	11 (13.4%)	27 (5.4%)
SOC	7 (8.5%)	6 (1.2%)
VA	6 (7.3%)	11 (2.2%)
PES	4 (4.9%)	9 (1.8%)
MAT	2 (2.4%)	1 (0.2%)
OTH	2 (2.4%)	389 (78.1%)

To isolate genuine interdisciplinary co-occurrence from the form/content artifact, we recomputed co-occurrence using only content-content code pairs (i.e., excluding OTH, which by definition carries no disciplinary attribution). Table 4 reports the proportion of units per component type that carry two or more content disciplines simultaneously.

Table 4

Genuine (Content–Content) Interdisciplinary Co-occurrence by Component

Component	Total Units	Multi-Discipline Units	Rate
Text	82	12	14.6%
Activity	498	20	4.0%

Text units show a co-occurrence rate approximately 3.6 times higher than Activity units. The specific discipline pairings also differ by component (see Table 5).

Table 5

Most Frequent Content-Discipline Combinations, by Component

Text	n	Activity	n
LIF+SOC	4	SCI+VA	5
PES+LIF	3	PES+LIF	3
LIF+MAT	2	VA+LIF	3
SCI+LIF	1	LIF+SOC	2
SCI+SOC	1	SCI+LIF	2
VA+LIF+SOC	1	SCI+SOC, VA+SOC, LIF+MAT, PES+SCI	1 each
		SCI+VA+LIF	1

In Text units, the leading pairing was LIF+SOC; in Activity units, it was SCI+VA. No Preparation-type units were identified in either textbook (see Section 2.3.2), and this component type is therefore not represented in the comparison

3.3. Findings for RQ3

For each content discipline, we calculated the proportion of its total occurrences that involved co-occurrence with at least one other content discipline (see Table 6).

Table 6

Interdisciplinary Integration Rate by Learning Area

Discipline	Total Occurrences	Co-occurring	Isolated	Integration Rate
MAT	4	3	1	75.0%*
SOC	24	10	14	41.7%
PES	20	7	13	35.0%
SCI	83	12	71	14.5%
VA	83	11	72	13.3%
LIF	288	23	265	8.0%
MUS	0	0	0	N/A

**Based on n = 4; interpret with caution*

Social Studies (SOC) and Physical Education and Sports (PES) showed the highest integration rates among disciplines with adequate sample sizes. Life Studies (LIF), despite being the most frequently occurring content discipline overall, shows the lowest integration rate (8.0%); 92.0% of its occurrences are isolated (single-discipline). Music (MUS) is entirely absent from the corpus (0/580 units) and, therefore, cannot be evaluated for interdisciplinary integration. Partner-discipline analysis (see Table 7) shows that LIF is the most frequent co-occurrence partner for every other discipline.

Table 7
Most Frequent Co-occurrence Partner, by Discipline

Discipline	Partners (frequency)
LIF	SOC (7), PES (6), VA (5), SCI (4), MAT (3)
SCI	VA(6)+LIF(4)+SOC(2)+PES(1)
VA	SCI (6), LIF (5), SOC (2)
SOC	LIF (7), VA (2), SCI (2)
PES	LIF (6), SCI (1)
MAT	LIF (3)
MUS	—

3.4. Findings for RQ4

According to the TCMM Content Framework, interdisciplinary knowledge is identified as one of the four foundational knowledge types, along with discipline-specific, epistemic, and procedural knowledge, and is expected to be integrated across all learning areas (MoNE, n.d.). Contrary to this conceptual expectation, the findings reveal a more limited pattern of interdisciplinary integration. Across the combined Text and Activity corpus, genuine content-to-content interdisciplinary co-occurrence accounted for only 5.5% of all analytical units (32 of 580). Moreover, among the seven content disciplines, only Social Studies (SOC) and Physical Education and Sports (PES) achieved integration rates exceeding 30% among disciplines with adequate sample sizes (n = 24 and n = 20, respectively); Mathematics showed a nominally higher rate (75.0%) but was based on only four occurrences and is therefore not interpreted as a stable pattern. In contrast, Music (MUS) was not represented in the corpus and therefore exhibited no measurable interdisciplinary integration, whereas Life Studies (LIF), although the most frequently represented discipline (n = 288), showed the lowest integration rate (8.0%) among disciplines with an adequate number of observations. Collectively, these findings indicate that interdisciplinary connections are present in the textbooks but are distributed unevenly across learning areas and are not proportional to the overall representation of individual disciplines in the corpus.

4. Discussion

4.1. Discussion of RQ1

Although the dominance of the DGR/OTH code in raw frequencies (67.4%) may initially appear to be a striking finding, it does not directly reflect the distribution of content. This is a natural outcome of the form-content dual coding rule (Decision 2), in which form and content are addressed at different analytical levels (Krippendorff, 2019). Therefore, interpreting DGR/OTH frequencies together with content disciplines may lead to inaccurate results. When the distinction between form and content is considered, Life Studies (LIF) emerges as the most represented content discipline in textbooks, constituting 32.3% of total citations.

This distribution is consistent with the findings reported in interdisciplinary curriculum research. Cohen et al.'s (2024) scoping review revealed that interdisciplinary practices in K-12 humanities teaching still lack a common conceptual framework and that there is no agreed-upon criterion for evaluating balanced interdisciplinary integration. Consequently, the asymmetric disciplinary distribution observed in this study cannot be considered an indicator of insufficient interdisciplinary integration. Similarly, Applebee, Adler and Flihan (2007) emphasize that the quality of interdisciplinary integration depends more on design choices made in line with the aims of the curriculum than on equal representation of disciplines. In this context, the dominance of the Life Studies discipline may not be interpreted as a

deficiency in interdisciplinary integration but as a reflection of a life-centered curriculum design that prioritizes everyday life skills.

On the other hand, the limited representation of Mathematics (0.4%) and Music (0%) disciplines is another striking finding. The observation of a similar pattern in both textbooks suggests that this distribution reflects a deliberate curricular design rather than random occurrence. However, whether this pattern stems from the prioritization of functional skills, curricular choices, or different editorial processes cannot be explained by the current data. Therefore, qualitative research involving textbook authors, editors, or curriculum developers is needed to determine the causes of this situation.

4.2. Discussion of RQ2

The rate of interdisciplinary integration observed in the text component (14.6%) was approximately 3.6 times that identified in the activity component (4.0%). In addition, the two components displayed distinct interdisciplinary patterns. While the most frequent combination in the texts is Life Studies + Social Studies (LIF + SOC), the predominant pairing in the activities is Science + Visual Arts (SCI + VA). However, the formation mechanisms of these two patterns appear to be different. The SCI + VA combination in activities mostly results from qualifying expressions such as color and pattern added to animal or object descriptions, while the LIF + SOC and PES + LIF combinations seen in texts arise through narrative contexts that naturally develop within the storyline.

This raises the question of whether these patterns represent the same degree of interdisciplinary integration. Within the framework of Bernsteinian curriculum theory, Hu (2023) argues that interdisciplinary integration should be built upon strong disciplinary foundations and that integration attempts weakly supported by the theoretical coherence of disciplines may result in more fragile structures. Considering this theoretical perspective, the SCI + VA combinations observed in the activity component can be interpreted as co-occurrences resulting from shared linguistic structures rather than genuine conceptual integration between the two disciplines. In contrast, interdisciplinary relationships that develop within the storyline in the text component may present a structure in which different disciplines contribute more holistically to the meaning-making process. Nevertheless, this assessment is based on a theoretical interpretation of the findings derived from document analysis, and the educational quality or instructional function of these patterns cannot be directly tested with the available data. Therefore, the scope of this interpretation should be evaluated within the framework of the methodological limitations discussed in the following sections.

4.3. Discussion of RQ3

Intensity of Interdisciplinary Integration Across Learning Areas: Although Social Studies (SOC) (41.7%) and Physical Education and Sports (PES) (35.0%) were represented by relatively few instances, they exhibited the highest rates of interdisciplinary integration, with references to these disciplines being most frequently co-coded with other subjects. In contrast, Life Studies (LIF), the most frequently represented content discipline in the corpus, displayed a markedly different pattern, with an integration rate of only 8.0%. Nevertheless, LIF remained the most common partner across all interdisciplinary combinations. This pattern suggests that while Life Studies occupies a highly connected position within the network of interdisciplinary relationships, it functions as a central contextual domain with a comparatively low level of integration.

Viewed within the broader literature on interdisciplinary curricula, this pattern suggests that different disciplines may serve distinct functions in curriculum design. In particular, the case study conducted by Applebee, Adler, and Flihan (2007), which examined interdisciplinary practices in middle and high school classrooms, demonstrated that interdisciplinary instruction does not follow a single organizational model and that different curriculum designs involve different pedagogical priorities and trade offs. From this perspective, the central position of Life Studies in the present corpus may indicate that it functions as a shared contextual domain through which connections with other fields are established. However, the document analysis conducted in this study does not allow for inferences as to whether this pattern reflects an intentional curriculum design decision. Accordingly, the role of Life Studies within the interdisciplinary structure warrants further investigation through qualitative research focusing on textbook development processes and curriculum design.

Alternative Interpretations of Intercoder Disagreements: The intercoder reliability analysis identified eight disagreements (n = 8/117), all of which were concentrated around two coding boundaries: the distinction between form and content, and the classification of animal actions and color-pattern descriptions. Notably, these boundaries corresponded to the most frequently observed interdisciplinary combination in Table 5 (SCI + VA). This convergence allows for more than one methodological interpretation.

One possible explanation is that these coding boundaries involve conceptually adjacent categories that are difficult to distinguish consistently during the coding process. Consistent with Krippendorff's (2019) emphasis on clearly operationalized categories and explicit coding rules as prerequisites for reliable content analysis, the observed disagreements suggest that these particular category boundaries require careful operational definition.

Viewed through Hu's (2023) Bernsteinian perspective, an alternative interpretation is also possible. Rather than attributing disagreements solely to conceptual ambiguity, the present findings may also be interpreted as reflecting the way disciplinary boundaries were operationalized within the coding framework. From this perspective, the concentration of disagreements may be associated not only with the nature of the categories themselves but also with the application of the coding scheme, particularly in instances where Rule B permitted dual coding of adjective-noun constructions. This interpretation represents a theoretical reading of the findings rather than a direct implication of Hu's study. The present data do not permit discrimination between these explanations. Following Neuendorf's (2017) iterative approach to content analysis, the observed disagreements may indicate the need for further refinement of the coding categories and operational definitions in future applications of the coding scheme.

4.4. Discussion of RQ4

The Content Framework of the TCMM identifies interdisciplinary knowledge as one of the four foundational knowledge types and envisages its integration across all learning areas (MoNE, n.d.). A useful point of comparison regarding how this principle is reflected at the curriculum level is provided by the analysis of the 2024 Social Studies Curriculum conducted by Karasu Avcı and Turan (2025). Their study reported that the curriculum explicitly establishes connections with multiple disciplines, including philosophy, sociology, political science, history, geography, economics, psychology, and information technology. These findings suggest that interdisciplinary relationships can be explicitly articulated at the curriculum document level.

In contrast, the findings of the present study indicate that the same principle is reflected more limitedly at the textbook level. Across the corpus, the rate of genuine interdisciplinary integration was only 5.5% (32 of 580 analytical units), with Music (MUS) being entirely absent and Mathematics (MAT) receiving minimal representation. These findings do not permit direct causal inferences regarding the extent to which the integrative TCMM principles were transferred into the textbook development process. Nevertheless, the contrast between the curriculum-level evidence reported by Karasu Avcı and Turan (2025) and the textbook-level findings of the present study suggests that the same policy framework may be reflected differently across levels of educational implementation.

This pattern bears conceptual similarity to broader curriculum research, indicating that principles explicitly articulated in policy documents may not be reflected to the same extent in instructional materials or educational practice. In this regard, Voogt and Roblin (2012) reported strong horizontal consistency across international frameworks for 21st-century competencies while identifying considerably weaker vertical consistency between policy intentions and their implementation in educational practice. Although their study focused on a different topic, document type, and unit of analysis, the pattern they identified, namely that principles articulated at the policy level are not always reflected to the same extent during implementation, provides a useful conceptual lens for interpreting the findings of this study. Similarly, a systematic review by Kadirhan and Şat (2025) found that teachers and other stakeholders perceived curriculum rigidity and insufficient professional support as important challenges in TCMM implementation. However, it should be emphasized that this potential explanation was not directly examined within the scope of the present study.

Taken together, the findings across the four research questions indicate that interdisciplinary integration is not absent from the textbook series examined; however, once the effects of the form-content coding convention are considered, its overall level remains relatively limited. Furthermore, interdisciplinary relationships are generated through different mechanisms in the Text and Activity components and are unevenly distributed across learning areas. These findings suggest that explicitly defining interdisciplinary relationships within the curriculum does not necessarily ensure that they will be reflected to the same extent in textbook design. Moreover, because the present study examined only two textbooks, these findings should not be generalized to all instructional materials developed within the TCMM framework. Future research should systematically examine the alignment between curriculum policy documents and instructional materials across different subject areas and educational levels.

5. Conclusions and Recommendations

This study examined the extent and pattern of interdisciplinary integration in two Turkish special-education textbooks developed within the TCMM framework. Overall, the findings indicate that interdisciplinary integration is present but limited, unevenly distributed across disciplines, and realized through different mechanisms in narrative texts and instructional activities in the curriculum. Although Life Studies constitute the dominant content discipline, this predominance is not accompanied by a comparable level of interdisciplinary integration. Conversely, Social Studies and Physical Education and Sports exhibited the highest relative levels of interdisciplinary integration, despite their comparatively low overall representation. Taken together, these findings suggest that the textbooks examined reflect only partial and inconsistent integrative principles of TCMM. Beyond the specific findings of the textbook analysis, this study highlights an important curriculum issue. The results suggest that the explicit inclusion of interdisciplinary integration as a curriculum principle does not necessarily ensure balanced realization in instructional materials. This distinction is particularly important in special education, where textbooks are one of the primary instructional resources

for students with moderate-to-severe intellectual disabilities and autism spectrum disorder. Consequently, the limited representation of particular disciplines may reduce students' opportunities to encounter a broad range of curricular content through integrated learning experiences.

Methodologically, this study contributes by providing a transparent and replicable quantitative coding framework for examining interdisciplinary integration in textbooks. The coding scheme, operational definitions, and coding decision rules developed in this study offer a systematic approach that can be adapted for comparative analyses across different subjects, educational levels and curriculum contexts.

Based on these findings, several recommendations can be made. For textbook authors, the MoNE Special Education Textbook Commission. The coding framework and boundary-case rules developed in this study (Appendix OSF) could provide a practical framework for reviewing draft textbooks prior to publication. Such a review process may help identify disciplinary imbalances, particularly the limited representation of Mathematics and Music during textbook development. For teachers. Given the limited representation of Mathematics and Music, classroom instruction may benefit from supplementary instructional materials and interdisciplinary activities that incorporate these disciplines within the life-centered and narrative structure of existing textbooks, rather than presenting them as isolated learning experiences. For policy makers. The discrepancy observed between the interdisciplinary principle articulated in the TCMM and its realization in the analyzed textbooks suggests that curriculum principles may need to be translated into explicit and operational criteria for developing textbooks. Establishing such criteria could facilitate greater consistency between curriculum policies and instructional materials.

For future research. Future studies should extend this line of inquiry in three ways. First, qualitative studies involving textbook authors and editors could explore whether the observed disciplinary distribution reflects intentional design decisions or established editorial practices in the field. Second, the coding framework developed in this study should be applied to the complete TCMM special education textbook series to determine whether the identified patterns are consistent across all educational stages. Third, comparative studies examining both special and general education textbooks would help determine whether the disciplinary patterns identified in this study are specific to special education materials or represent a broader characteristic of Turkish primary-level textbook design. Collectively, these recommendations may contribute to a more systematic evaluation of the alignment between curriculum policy and instructional materials and support the implementation of interdisciplinary curriculum reforms in the field of special education.

Declaration of Conflicts of Interest

The author declares no conflicts of interest.

Declaration of Generative AI Use

No generative artificial intelligence tools (e.g., ChatGPT, Gemini, Claude, etc.) were used in the preparation of this study. All text, analysis, and content were produced solely by the author through human effort.

Ethical Statement

This study was based solely on the analysis of publicly available curriculum documents and textbooks. It did not involve human participants, personal data, or animal subjects. Therefore, in accordance with institutional and national regulations, ethical approval and informed consent were not required.

Author Contributions

The author conceived and designed the study, developed the methodology, collected and coded the data, performed the statistical analyses, interpreted the findings, wrote and revised the manuscript, and approved the final version.

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