ONE REFORM VOCABULARY, TWO CURRICULA: PRIMARY MATHEMATICS IN TÜRKİYE AND NORTH MACEDONIA

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Abstract

This study compared how the recently renewed Grade 1–3 mathematics curricula of Türkiye and North Macedonia, both written in the language of learner-centred education, approached teaching and learning at the level of the intended curriculum. Through qualitative document analysis, the pedagogical suggestions in the curricula were coded along five dimensions: teacher and student roles, structuring of learning, teaching methods and techniques, connections to daily life, and responsiveness to individual differences. In both curricula, students were given the primary role more often than teachers, concrete materials were the most common means of instruction, and links to daily life were concentrated in measurement, money and time. The main differences concerned who acts in the text and how much guidance it offers. The Turkish curriculum set out the learning sequence explicitly, gave students a wider range of roles and attached support and enrichment to every learning outcome. Yet it mostly described student activity in impersonal constructions that left the actor unnamed, and many of its references to daily life named no concrete situation. In the North Macedonian curriculum, almost every activity example named students as the actors, but what they were asked to do was mostly to follow instructions. Teachers were rarely assigned a role after Grade 1, and inclusion was addressed only in a common section separate from the activities. The same reform vocabulary thus produced two quite different curriculum texts, partly because of the way the documents are written. The results point to concrete revisions for both curricula.

Keywords: comparative curriculum analysis; primary mathematics education; learner-centred pedagogy; teacher and student roles; Türkiye; North Macedonia

1. Introduction

Over the past decade, many education systems have rebuilt their primary curricula around competences, active participation and the expectation that students construct knowledge rather than receive it. Schweisfurth (2015) describes learner-centred pedagogy as "a globally-travelling prescription for improvements to teaching and learning" that has repeatedly run into problems of definition, inappropriate transfer and implementation (p. 259). Research on policy borrowing adds that borrowing "is never wholesale, but always selective," and that labels such as student-centred learning take on different meanings once adapted locally (Steiner-Khamsi, 2014, pp. 156, 160). In the final stage of borrowing, an imported idea is internalised and re-contextualised by the receiving system (Phillips & Ochs, 2003, pp. 456–457). Curriculum documents are among the first places where this becomes visible, because they turn a shared international vocabulary into national guidance for teachers.

Türkiye and North Macedonia renewed their primary mathematics curricula at almost the same time. In Türkiye, the curricula of the Türkiye Century Education Model were introduced in Grade 1 in the 2024–2025 school year (Millî Eğitim Bakanlığı [MEB], 2024). Compared with the 2018 programme, the new primary mathematics curriculum replaced 229 learning objectives with 111 learning outcomes, adopted a skill-based thematic structure built around daily-life problems, and introduced the four operations in Grades 3 and 4 through estimation and mental calculation before procedural work (Kuzu et al., 2025). In North Macedonia, the Concept Note on Primary Education launched a six-year, competence-based reform in 2021–2022 (Lameva, 2024, pp. 3–4). The teacher's role, it states, "is not to present the content to be learnt to the students, but to put students in problem solving situations" (Ministry of Education and Science [MES], 2021, p. 28); teachers are to act as "partners and facilitators of the learning process" (MES, 2021, p. 43).

Both reforms, then, speak the language of active learners, meaningful contexts and inclusion (MEB, 2026, p. 8; MES, 2021, pp. 9–10, 28). Whether their curriculum texts give that language the same shape is another matter. Ahl et al. (2017) show that written curriculum materials carry a voice: the way they phrase instructions positions teachers and students as more or less autonomous actors (pp. 35–37). Comparing this positioning in two systems that reformed in parallel is one way of examining the intended curriculum (van den Akker, 2003) before it reaches classrooms.

1.1 Literature review: The comparative studies of mathematics curricula involving Türkiye identified in this review have looked mainly towards high-performing or neighbouring systems and have concentrated on structure and content. Teke and Durmuş (2023) compared the Grade 1–8 curricula of Türkiye and five other systems, including Singapore and Shanghai, and found that all stressed problem solving but that the systems with strong recent PISA results treated it in more detail. Ismail-Amet and Kaleli-Yılmaz (2022) compared the Grade 5–8 curricula of Türkiye and Greece, and Polat and Tutak (2026) compared the Türkiye Century Education Model with China's 2022 curriculum, describing the former as simplifying content and linking it to daily life. Teaching–learning processes, where included at all, are seldom the main object of comparison.

Studies of the new Turkish curriculum have so far been conducted within a single country and have mostly examined a particular feature. Besides Kuzu et al.'s (2025) comparison of the 2018 and 2024 programmes, Şen (2025) found that geometry tasks across Grades 1–12 were predominantly of high cognitive demand, and Altuntaş (2026) showed that visual-spatial reasoning is spread across grade levels without being named as a progression, so that its recognition "may largely depend on teachers' interpretations" (p. 269). Teachers interviewed by Daştan and Aydın (2025) welcomed the curriculum's student-centred, real-world orientation but reported difficulties in implementing it.

The few studies that bring Türkiye and North Macedonia together lie outside school mathematics, comparing primary teacher education programmes (Aksoy Tokgöz & Hasan, 2017) and curricula for students with special educational needs (Ramo Akgün et al., 2016). In the literature reviewed for this study, no comparison of the two countries' primary mathematics curricula was found, nor any study of how their current curricula frame teaching and learning.

1.2 Problem statement and purpose of the study: The two countries share more than a reform calendar. Turkish is one of the languages of instruction in North Macedonian primary schools (Lameva, 2024, p. 2), and the Bureau for Development of Education publishes Turkish versions of the mathematics curricula examined here (Ministerstvo za obrazovanie i nauka [MON], 2021a, 2021b, 2022). Shared commitments take on practical meaning in the detailed guidance that curriculum texts give teachers. Seeing how two systems translated similar commitments into such guidance during the same period can help curriculum developers recognise the choices built into their own documents and help teachers read those documents more critically.

This study therefore compared the Grade 1–3 mathematics curricula of Türkiye and North Macedonia in terms of their learning–teaching approaches. It addressed three questions: (1) How do the two curricula define teacher and student roles and structure the learning process? (2) How do they address teaching methods and techniques, connections to daily life and responsiveness to individual differences? (3) What similarities and differences emerge between the two curricula on these dimensions, across Grades 1–3 and across mathematical subject areas?

2. Method

2.1 Research design: This study used qualitative document analysis (Bowen, 2009) to compare the official Grade 1–3 mathematics curricula of Türkiye and North Macedonia at the level of the intended (written) curriculum (van den Akker, 2003). The documents were analysed through qualitative content analysis that combined deductive coding based on a predefined framework with decision rules that emerged from the data (Fereday & Muir-Cochrane, 2006; Schreier, 2012), and the coded units were summarised descriptively as frequencies and percentages. The comparison followed two stages: each curriculum was first described and interpreted on its own, and the two were then placed side by side and compared. Figure 1 summarises the design and the data collection and analysis process.

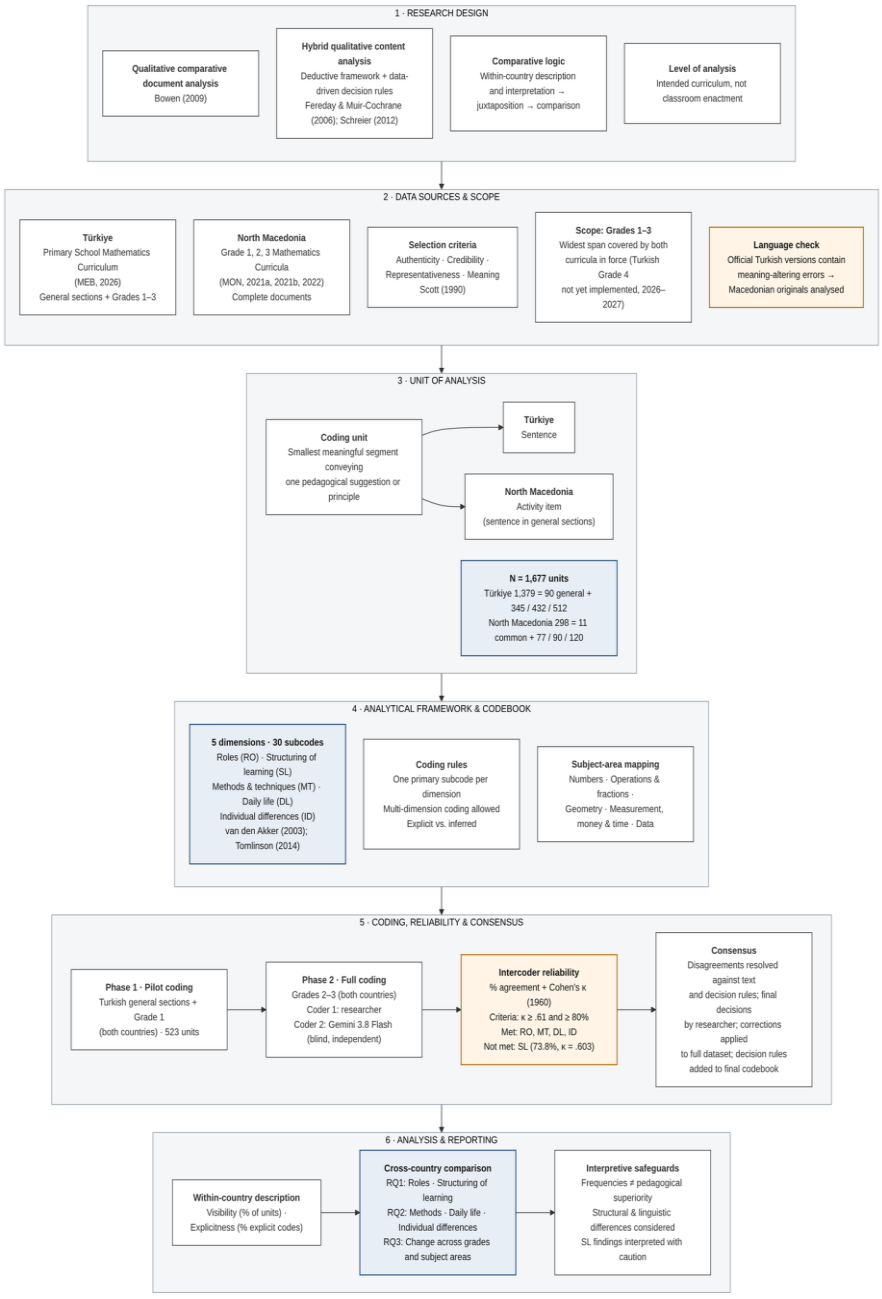


Figure 1. Research design, data collection and analysis process

2.2 Data sources and scope: The data sources were Türkiye's Primary School Mathematics Curriculum (MEB, 2026) and North Macedonia's Grade 1, 2 and 3 mathematics curricula (MON, 2021a, 2021b, 2022), selected according to the criteria of authenticity, credibility, representativeness and meaning (Scott, 1990). The original Macedonian texts were used because the official Turkish versions contained translation errors that altered meaning. For instance, "усните одговори на прашања поставени од наставникот или од соучениците" [oral answers to questions asked by the teacher or by classmates] (MON, 2021a, p. 14) was rendered as "sorulara sözlü cevaplar vermeyin" [do not give oral answers to questions] (MON, 2021a, Turkish version, p. 13).
The analysis covered the general sections and the Grade 1–3 sections of the Turkish curriculum and the North Macedonian curricula in their entirety. Grades 1–3 are the widest range common to the curricula in force in both countries: primary school lasts four years in Türkiye (6287 sayılı Kanun, 2012), the first period of basic education in North Macedonia covers Grades 1–3 (European Commission, 2026; Lameva, 2024), and the Turkish curriculum, implemented gradually since 2024–2025 (MEB, 2024), had not yet reached Grade 4 in 2026–2027.

2.3 Coding unit and scope of analysis: The coding unit was the smallest self-contained segment of text conveying a single pedagogical suggestion or principle, that is, who is to do what (and, where relevant, for what purpose). In the Turkish curriculum, which lists suggestions sentence by sentence, this usually corresponded to a sentence; in the North Macedonian curricula, it corresponded to an activity item under "Examples of activities" (or to a sentence in the general sections). Units with several features were coded under more than one dimension rather than split, and sentences that merely exemplified or stated the outcome of the preceding sentence ("For example...", "In this way..."), as well as consecutive questions, were merged with the preceding unit.
Sections were matched by function. In the Turkish curriculum, the general sections and, for each learning outcome, the headings Basic Assumptions, Pre-Assessment Process, Bridging, Learning–Teaching Practices, Support and Enrichment were coded; in the North Macedonian curricula, the activity examples and the inclusion and assessment section were coded. The latter, identical across the three grades, was coded once (the "common section"). Learning outcomes, assessment standards, subsections 1.2.1–1.2.5 of the Turkish curriculum and performance tasks that only proposed an assessment instrument were read as context, whereas statements on feedback, ongoing monitoring and prior knowledge were coded. In total, 1,677 units were analysed: 1,379 from Türkiye (90 from the general sections; 345, 432 and 512 from Grades 1–3) and 298 from North Macedonia (11 from the common section; 77, 90 and 120 from Grades 1–3).

2.4 Analytical framework and codebook: The analysis was carried out along five dimensions aligned with the process components of curriculum design (Table 1); the dimension of responsiveness to individual differences was grounded in differentiated instruction (Tomlinson, 2014). A unit could be coded under more than one dimension but received only one primary subcode within each; a further feature within the same dimension was recorded as a secondary code and excluded from the frequencies. Each code was also marked as explicit or inferred.

Table 1. Analytical framework, subcodes and intercoder agreement

Dimension	Operational definition	Subcodes	Agreement (%)	κ
Teacher and student roles (RO)	Assignment of actions and student agency	RO1 Explaining; RO2 Questioning/guiding; RO3 Organizing; RO4 Monitoring; RO5 Following instructions; RO6 Exploring; RO7 Explaining own thinking/discussing; RO8 Producing/choosing; RO9 Peer assessment	81.1	.774
Structuring of learning (SL)	Prerequisites, sequence, and stages of learning	SL1 Prior knowledge; SL2 Sequencing; SL3 Meaning-making; SL4 Monitoring/feedback	73.8	.603
Teaching methods and techniques (MT)	Types of instructional activities	MT1 Named methods; MT2 Games; MT3 Concrete/visual materials; MT4 Digital technology; MT5 Problem solving; MT6 Collaboration; MT7 Multisensory activities	87.0	.809
Connection to daily life (DL)	Links between mathematics and real-life contexts	DL1 Personal experiences; DL2 Immediate surroundings; DL3 Social life; DL4 Interdisciplinary connections	92.1	.787
Responsiveness to individual differences (ID)	Adaptation to learner differences	ID1 Inclusion; ID2 Support; ID3 Enrichment; ID4 Pace/level/interest; ID5 Special needs/IEPs; ID6 Gender/cultural diversity	98.7	.949

Note. Agreement and Cohen's κ on primary codes, Grade 2–3 units. Thresholds: $\kappa \geq .61$; agreement ≥ 80%.

Decision rules in the codebook specified how to handle ambiguities arising from the structural and linguistic differences between the documents. For example, no role was coded in passive constructions that merely stated that an activity takes place ("an activity is carried out"), and no connection to daily life was coded for references to "daily life" without a concrete context. Rules agreed during the resolution of disagreements were added to the final codebook. Units were also mapped onto five subject areas (numbers; operations and fractions; geometry; measurement, money and time; data): directly from the curriculum headings in North Macedonia and, in Türkiye, where themes do not correspond to subject areas, through the learning outcome to which each unit was linked.

2.5 Coding process and reliability: Coding was conducted in two stages: a pilot coding covering the general sections of the Turkish curriculum and the Grade 1 curricula of both countries (523 units), and a full coding covering Grades 2–3 (1,154 units). The researcher was the first coder. The Gemini 3.8 Flash model, as the second coder, coded the full-stage units independently, without access to the researcher's codes (Google AI Studio, temporary chat, tools disabled). Agreement on primary codes was calculated as percentage agreement and Cohen's (1960) κ, with $\kappa \geq .61$ (Landis & Koch, 1977) and at least 80% agreement (McHugh, 2012; O'Connor & Joffe, 2020) as criteria. Four dimensions met both criteria (Table 1); structuring of learning did not (73.8%; $\kappa = .603$), so findings for this dimension are treated as

tentative. Disagreements were reviewed against the decision rules, the researcher made the final decisions, and the resulting corrections were applied to the whole dataset.

2.6 Translation, use of artificial intelligence and limitations: The Macedonian units were translated with reference to the official Turkish versions and, for disputed units, with the support of a large language model (Claude Opus 5.5, Anthropic). Language models thus served only as translation support and as a second coder testing the independent applicability of the codebook; neither made final coding decisions. The design has several limitations. Because the units differ in form and are not formally equivalent, cross-country frequencies cannot be compared directly; the second coder was a language model, and the Macedonian translations were not verified by an independent expert; and the findings concern the pedagogy prescribed by the curricula, not classroom practice.

3. Findings

In the Turkish curriculum, pedagogical suggestions are presented through statements describing the stages of the learning process; in the North Macedonian curricula, they are presented through concrete activity examples (Table 2; subcodes in Table 3). Because the unit types and section structures differ, the percentages below show how approaches are expressed in the curriculum texts, not how often they are practised or whether one curriculum is pedagogically superior. Sections 3.1–3.2 address RQ1, Sections 3.3–3.5 RQ2 and Sections 3.6–3.7 RQ3.

Table 2. Visibility of the dimensions in Grade 1–3 units

Dimension	**TR units coded (%)**	**TR explicit (%)**	**NM units coded (%)**	**NM explicit (%)**
Teacher and student roles	72.0	52.0	99.7	96.2
Structuring of learning	44.7	69.3	24.7	76.1
Teaching methods and techniques	47.0	77.6	90.9	82.8
Connection to daily life	20.4	89.7	25.8	91.9
Responsiveness to individual differences	17.5	98.2	0.0[a]	–

Note. TR = Türkiye (*n* = 1,289 sentence-based units); NM = North Macedonia (*n* = 287 activity items). General sections (TR 90, NM 11 units) are reported separately under the relevant dimension. Explicit (%) = share of explicitly stated codes among the units coded in that dimension. [a] No grade-specific activity example addressed individual differences; relevant provisions appear in the common inclusion section.

Table 3. Distribution of primary subcodes by grade (% of grade-specific units)

Code	TR-1	TR-2	TR-3	NM-1	NM-2	NM-3
Teacher and student roles						
RO1 Teacher: explaining	10.7	13.7	11.7	14.3	0.0	0.8
RO2 Teacher: questioning, guiding	7.2	5.3	3.9	5.2	1.1	2.5
RO3 Teacher: organizing	4.6	4.2	3.7	2.6	0.0	0.0
RO4 Teacher: monitoring	1.7	1.6	2.0	0.0	0.0	0.0
RO5 Student: following instructions	13.9	18.3	20.1	50.6	56.7	59.2
RO6 Student: exploring, investigating	13.9	13.7	12.3	18.2	23.3	19.2

Code	TR-1	TR-2	TR-3	NM-1	NM-2	NM-3
RO7 Student: explaining thinking, discussing	8.1	12.3	10.7	6.5	7.8	6.7
RO8 Student: producing, designing, choosing	5.2	7.6	5.9	1.3	11.1	11.7
RO9 Student: assessing peers	0.3	1.6	0.6	0.0	0.0	0.0
Role not identifiable	34.2	21.8	29.1	1.3	0.0	0.0
Structuring of learning						
SL1 Prior knowledge and readiness	13.6	11.8	10.4	0.0	0.0	0.0
SL2 Staging and sequencing	11.9	8.6	11.7	0.0	5.6	4.2
SL3 Meaning-making	16.2	22.2	21.3	13.0	18.9	23.3
SL4 Ongoing monitoring and feedback	1.4	2.3	2.1	0.0	1.1	4.2
Teaching methods and techniques						
MT1 Named method or technique	2.9	1.4	1.8	1.3	2.2	1.7
MT2 Games and play	7.2	2.8	3.7	5.2	7.8	10.8
MT3 Concrete materials, visual representations	22.0	28.7	33.4	63.6	56.7	60.0
MT4 Digital technology	2.0	5.8	3.9	3.9	2.2	6.7
MT5 Problem solving	0.9	4.9	2.5	2.6	11.1	4.2
MT6 Discussion and collaboration	2.0	4.6	3.3	3.9	4.4	5.0
MT7 Embodied, multisensory activities	2.0	1.6	1.4	7.8	6.7	4.2
No method specified	60.9	50.2	50.0	11.7	8.9	7.5
Connection to daily life						
DL1 Students' own experiences, interests	5.5	5.3	4.3	6.5	2.2	5.8
DL2 School and immediate surroundings	5.2	2.8	2.7	10.4	7.8	3.3
DL3 Social life situations	8.1	14.4	7.8	10.4	14.4	15.0
DL4 Interdisciplinary connections	1.4	1.2	1.6	0.0	0.0	1.7
n (units)	345	432	512	77	90	120

Note. TR = Türkiye; NM = North Macedonia; 1–3 = grade level. Each unit received at most one primary code per dimension. General sections are excluded. Percentages may not total 100 because of rounding.

3.1 Teacher and student roles: In both curricula, the primary role was assigned to the student more often than to the teacher. In Türkiye, the student held the primary role in 48.7% of the units and the teacher in 23.3%. The roles of exploring, explaining one's thinking, producing and assessing peers (RO6–RO9) together accounted for 30.9% and were mostly expressed indirectly, as in "it is ensured that students [...] estimate" ["öğrencilerin [...] tahmin etmeleri sağlanır"] (MEB, 2026, p. 90). Of the 81 units coded for producing, designing or choosing (RO8), 34 appeared under the Enrichment heading. In 28.0% of the units, no role could be identified because of passive constructions such as "activities are carried out" ["etkinlikler yapılır"], and only 52.0% of the role codes rested on explicit statements.

In North Macedonia, the student held the primary role in 92.0% of the items, and 96.2% of the role codes were explicit. The most common role was following instructions (RO5; 50.6–59.2%), followed by exploring (RO6): "Students, divided into groups, receive models of 3D

shapes and, through discussion, discover which 2D shapes they are made of" (MON, 2021b, p. 9). Teacher roles accounted for 22.1% in Grade 1 and then declined sharply; in the common section, organising the environment and monitoring appeared in 6 of the 11 units.

3.2 Structuring of learning: Meaning-making (SL3) stood out in both curricula, but the two differed markedly in prior knowledge (SL1) and staging (SL2). In Türkiye, SL1 averaged about 11.7% and was largely associated with the Pre-Assessment Process and Bridging headings. SL2 appeared in statements of explicit progression (e.g., working first with money values up to 200 TL and then with larger values; MEB, 2026, p. 98). The general sections addressed prior knowledge (14.4%) and ongoing feedback (7.8%) as principles. In North Macedonia, SL3 increased with grade level (13.0%, 18.9%, 23.3%) and took the form of recognising relationships through concrete activities ("they grasp the inverse relationship between addition and subtraction"; MON, 2021a, p. 9). SL1 was not coded in the activities, SL2 was limited to Grades 2–3, and ongoing feedback (SL4) was defined in the common section as formative assessment (MON, 2021a, p. 13).
Of the 33 Turkish SL4 units, 18 gave the primary role to the teacher, seven to students and eight left the actor unspecified. In North Macedonia, six of the nine SL4 units described students checking one another's work, and the three involving the teacher were in the common section. Both curricula contained meaning-making activities based on comparing an estimate with the result of measuring or counting (MEB, 2026, p. 24; MON, 2022, p. 17). In North Macedonia, the order in which activities are listed may itself imply a sequence, but only explicitly stated sequencing was coded. Findings for this dimension should also be treated as tentative because intercoder agreement fell below the criteria (Section 2.5).

3.3 Teaching methods and techniques: Concrete materials and visual representations (MT3) were the most frequent approach in both curricula (North Macedonia 59.9%, Türkiye 28.8%), whereas named methods (MT1) and digital technology (MT4) were infrequent. In Türkiye, materials served to examine and represent relationships (e.g., base-ten blocks; MEB, 2026, p. 87), the only named methods were drama (MEB, 2026, p. 28) and question-and-answer, and no method was coded in 50.0–60.9% of the units. In North Macedonia, at least one method was coded in 90.9% of the items, and the activities described what students were to do with the materials (e.g., dividing 10 counters into two equal groups; MON, 2022, p. 15). Games (MT2) and embodied or multisensory activities (MT7) were more frequent than in Türkiye (e.g., the "I have ..., who has ...?" game; MON, 2021b, p. 10).

3.4 Connecting learning to daily life: Units with a concrete real-life context accounted for 20.4% in Türkiye and 25.8% in North Macedonia, and in both curricula the most frequent context was social life situations such as money, time and shopping (DL3). In Türkiye, 68 of the 141 units mentioning "daily life" were not coded because they named no concrete context. Concrete contexts centred on money and shopping (MEB, 2026, p. 32) and on data students collect from their own lives, such as the number of siblings (MEB, 2026, p. 119). In North Macedonia, of the 39 items coded DL3, 19 involved working with real objects such as money, clocks or calendars, seven involved word problems and four involved role-plays of shopping and banking (e.g., seller and buyer roles; MON, 2021b, p. 14). Interdisciplinary connections (DL4) appeared mainly as principles in the general and common sections. Whereas the Turkish emphasis on "daily life" often remained general, North Macedonian connections were made through specific objects, settings and role-plays.

3.4. Responsiveness to individual differences: The main difference in this dimension lay in where provisions for individual differences were placed: in Türkiye, under the Support and Enrichment headings attached to each learning outcome; in North Macedonia, in a common section separate from the grade-level activities (Table 4).

Table 4. Individual-differences codes by section and grade (number of units)

Code	TR gen.	TR-1	TR-2	TR-3	NM common	NM-1–3
ID1 Inclusion principle	6	0	1	3	1	0
ID2 Support	3	27	35	35	1	0
ID3 Enrichment	6	32	38	34	0	0
ID4 Pace, level, interest	4	6	4	9	1	0
ID5 Special needs, IEPs	0	0	0	0	1	0
ID6 Gender, cultural diversity	0	0	1	0	3	0
Units with an ID code (%)	19 (21.1)	65 (18.8)	79 (18.3)	81 (15.8)	7 (63.6)	0 (0.0)
Total units	90	345	432	512	11	287

Note. TR gen. = Turkish general sections (pp. 4–9); NM common = common inclusion and assessment section, identical across grades, coded once (Grade 1, p. 13); NM-1–3 = Grades 1–3 combined (77 + 90 + 120 units).

In Türkiye, 17.5% of the Grade 1–3 units were coded in this dimension, and almost all of them (216 of 225; 96.0%) fell under these headings. Some units stated the criterion for adaptation explicitly (e.g., games "to enable them to learn at their own pace"; MEB, 2026, p. 29). No explicit provision for special needs (ID5) was coded, and only one unit was coded ID6. In North Macedonia, none of the activity examples was coded in this dimension, but seven of the 11 common-section units (63.6%) were. This section refers explicitly to the individualised education plan and expects teachers to treat girls and boys equally and to avoid assigning them "roles based on gender stereotypes" (MON, 2021a, p. 13). The absence of codes in the activities therefore does not mean that the curriculum disregards individual differences.

3.6 Change across grade levels: In both curricula, meaning-making (SL3) and instruction-following (RO5) were more visible in Grade 3 than in Grade 1 (Table 3; Figure 2). In Türkiye, teacher roles and individual-differences codes remained at similar levels across grades, RO5 and MT3 increased, and games (MT2) and prior knowledge (SL1) decreased. In North Macedonia, teacher roles fell sharply after Grade 1 (22.1% → 1.1% → 3.3%), RO8 (1.3% → 11.7%) and MT2 (5.2% → 10.8%) increased, and school and immediate-surroundings contexts (DL2) decreased (10.4% → 3.3%). The decline in teacher roles does not in itself show that responsibility was transferred to students, and with only 77–120 items per grade these trends are descriptive patterns.

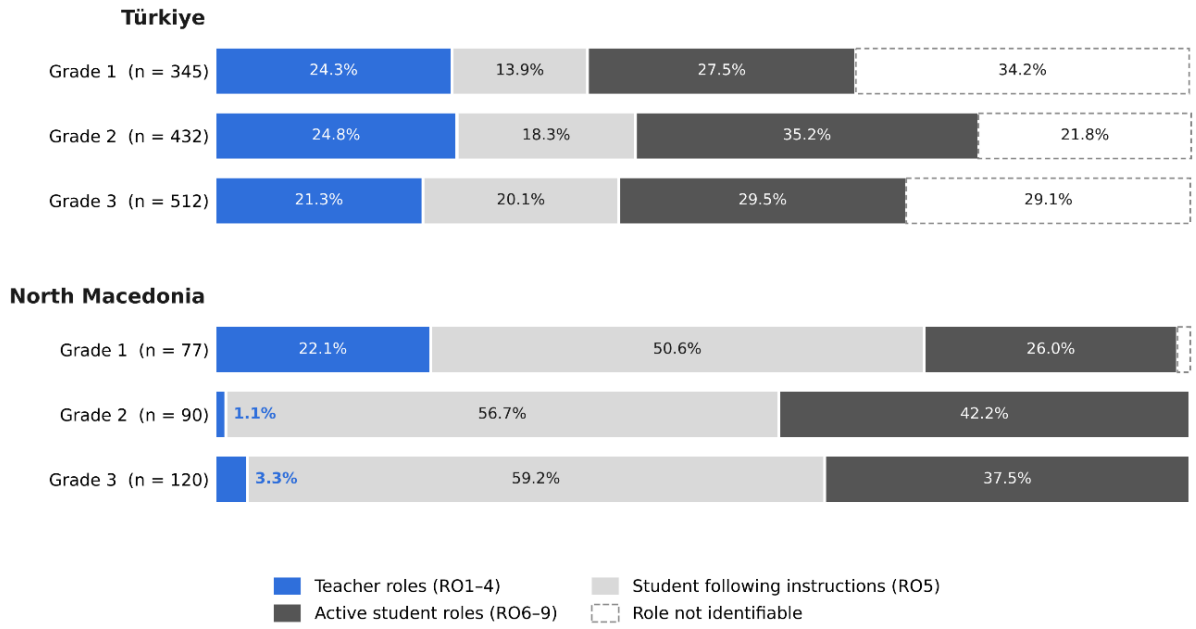


Figure 2. Distribution of primary roles across grades in Türkiye and North Macedonia

3.7 Similarities and differences across mathematical subject areas: The visibility of pedagogical approaches also varied by subject area (Figure 3). In both curricula, connections to daily life were most frequent in measurement, money and time (Türkiye 50.6%; North Macedonia 78.8%) and fell below 10% in numbers and in operations and fractions. Operations and fractions had the lowest share of MT3 but the highest share of SL3 in both curricula.
Active student roles (RO6–RO9) clustered in data in Türkiye (46.8%), consistent with the Data-Based Research themes in which students formulate research questions and collect data, but in operations and fractions (43.2%) and geometry (41.5%) in North Macedonia. In data, 55.6% of the North Macedonian activities contained a concrete context related to the class or the students, compared with 14.7% in Türkiye. In the North Macedonian numbers area, students followed instructions in 73.6% of the items (44.6–57.7% in the other areas): being the explicit subject did not mean taking on the same role in every area.

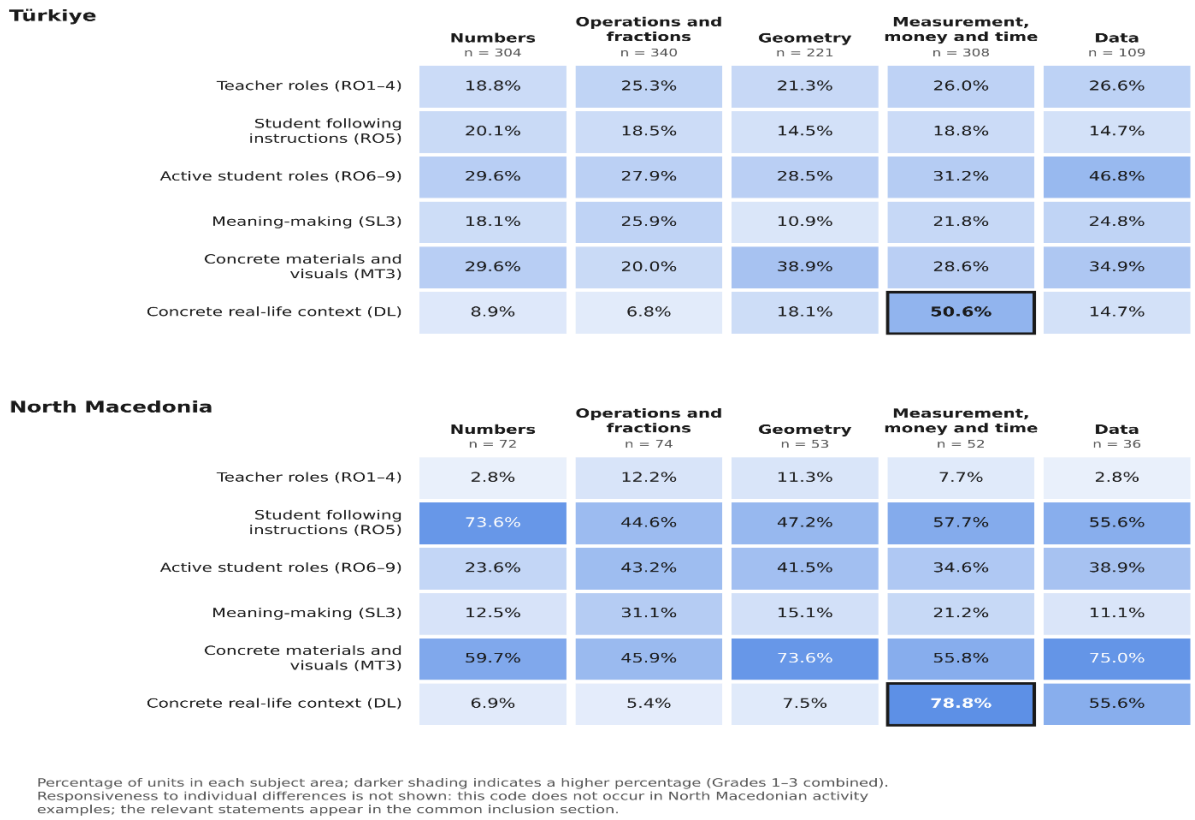


Figure 3. Key pedagogical indicators by mathematical subject area in Türkiye and North Macedonia (Grades 1–3 combined)

Note. Units per subject area (TR / NM): numbers 304 / 72; operations and fractions 340 / 74; geometry 221 / 53; measurement, money and time 308 / 52; data 109 / 36. Fractions were grouped with operations to match the North Macedonian structure; seven Turkish units that could not be assigned to a single area were excluded, and grades were combined because some North Macedonian grade-by-area cells contained few units.

4. Discussion

The two curricula share a broad commitment to active learning but write it into their texts in different ways. The differences discussed below concern how the documents frame teaching and learning, not classroom practice.

4.1 Who acts in the curriculum text? The sharpest contrast concerned roles. In the North Macedonian activity examples, the student was the explicit subject of almost every item, which matches the Concept Note's position that what students do during a lesson matters more than what the teacher does (MES, 2021, p. 28). The action assigned to students, however, was mostly carrying out a task as directed. Herbel-Eisenmann (2007, as cited in Ahl et al., 2017, pp. 35–36) described a similar pattern in a mathematics textbook whose commands positioned the learner as a "scribbler," someone who does mathematics according to scripted instructions. Even as producing and designing roles grew after Grade 1, instruction-following remained dominant. The North Macedonian texts thus appear to have shifted agency to the student grammatically more than pedagogically.

Teacher roles, by contrast, became rare in the North Macedonian activity examples after Grade 1. Ahl et al. (2017) use the phrase "talking past the teacher" for writing that builds a narrative involving only the student and the material and leaves the teacher as an observer (p. 38); the

Grade 2 and Grade 3 activity lists come close to this pattern. The teacher is not absent from the curriculum as a whole, since the common section assigns the roles of organising the learning environment and monitoring students, and part of the pattern may reflect genre: a list of activity examples tends to put students in the foreground. Even so, the Grade 2 and Grade 3 items say little about what the teacher is expected to explain, ask or monitor.

The Turkish curriculum distributed student roles more evenly across exploring, explaining, producing and following instructions, and described the teacher's work more often. Student roles were mostly expressed through the impersonal construction "... sağlanır" (it is ensured that students ...), which names what students are to do but not who is to make it happen. In Ahl et al.'s (2017) terms, this comes closest to talking through the teacher: the text sets out the intended student activity and implicitly expects the teacher to bring it about, without addressing the teacher directly (pp. 36–37). In many units, passive forms such as "etkinlikler yapılır" (activities are carried out) left no identifiable actor at all. Moreover, a considerable share of the units in which students produce, design or choose appeared under the Enrichment heading. This partly frames these roles as an extension for some students rather than as part of everyone's core learning, whereas in North Macedonia the same roles appeared within the regular activity examples.

Monitoring and feedback ran against this pattern. The North Macedonian curriculum, which otherwise kept students in an instruction-following role, mostly gave them a share in checking one another's work, whereas the Turkish text assigned monitoring mainly to the teacher and left peer assessment marginal. This pattern rests on few units from the dimension with the lowest intercoder agreement and remains tentative.

These contrasts are consistent with Schweisfurth's (2015) observation that learner-centred education is not a single continuum but several, with epistemological, technique-related and relational dimensions (p. 262). The North Macedonian text appears more learner-centred in that it names students as the actors in almost every activity; the Turkish text appears more learner-centred in that exploring, explaining and producing carry more weight than following instructions among the student roles it specifies. Neither curriculum, therefore, can simply be described as more learner-centred than the other.

4.2 Structuring of learning and teaching methods: The Turkish curriculum makes the sequence of learning explicit: its headings for each learning outcome (Basic Assumptions, Pre-Assessment Process, Bridging and Learning–Teaching Practices) move from what students already know to new content, consistent with Schweisfurth's (2015) standard that "what is taught needs to build on learners' existing knowledge and skills" (p. 264). The North Macedonian activity examples made no explicit reference to prior knowledge; instead, the Concept Note leaves Grade 1–3 teachers free to plan teaching as a whole and to adjust its pace to students' prior knowledge, interests and abilities (MES, 2021, p. 28). Establishing a sequence that the activity examples do not state is thus left to teachers. Even the more explicit Turkish text does not name every progression, as Altuntaş (2026) showed for visual-spatial reasoning. As noted above, differences in this dimension are tentative.

Both curricula also supported meaning-making by asking students to compare estimates with the results of counting or measuring, an emphasis Kuzu et al. (2025) likewise note in the new Turkish curriculum's treatment of liquid measurement (p. 121).

Nearly all North Macedonian activity examples named at least one method or material, whereas many Turkish grade-level units named none. This partly reflects the genre of the text rather than its pedagogy: units under headings such as Basic Assumptions describe what students are expected to know already, not an activity. Games moved in opposite directions across grades, becoming less visible after Grade 1 in Türkiye and more visible in North Macedonia. DePascale and Ramani's (2025) systematic review found that games support mathematics learning from

preschool through third grade and "can continue to facilitate math learning throughout development, even as math content becomes more advanced" (p. 16). Against this evidence, the lower visibility of games in the Turkish Grade 2 and 3 texts may be a missed opportunity, although playful activities may simply be described in other terms for older students.

4.3 Connections to daily life: Both curricula present mathematics as connected to daily life, mostly in measurement, money and time, while numbers and operations are rarely set in real situations. The difference lies in how concrete that connection is. In the Turkish curriculum, nearly half of the grade-level units that mention "daily life" name no specific situation. Recent studies describe the Türkiye Century Education Model as linking mathematics to daily life (Kuzu et al., 2025; Polat & Tutak, 2026), but in Grades 1–3 this link is often stated as a principle rather than built into a task. The North Macedonian activities, by contrast, reflect the Concept Note's principle of content "related to the everyday life" (MES, 2021, p. 9) through tangible objects and situations such as coins, clocks, calendars and role-plays of shopping and banking. Data handling shows the same difference, even though the Turkish data area contained the most active student roles.
Schweisfurth (2015) counts a curriculum relevant to learners' present and future lives among her minimum standards for learner-centred education, but she also asks "who decides what is relevant to learners' lives" (p. 264). In both curricula, students' own experiences and interests rarely served as the context; relevance is therefore defined largely by the curriculum itself rather than drawn from students' lives.

4.4 Responsiveness to individual differences: The Turkish curriculum attaches Support and Enrichment suggestions to each learning outcome, weaving differentiation into the grade-level guidance. This is in line with Deunk et al.'s (2018) meta-analysis of primary education studies, which found positive effects when differentiation formed part of a broader programme or reform. The Turkish provisions, however, were almost entirely level-based, with no explicit provision for students with special educational needs and almost no attention to gender or cultural diversity. The North Macedonian curriculum took the opposite route: its activity examples contained no differentiation, while the common section set out principles of inclusion, individualised education plans and equal treatment of girls and boys, in keeping with the Concept Note (MES, 2021, p. 10). The Turkish text thus offers concrete differentiated tasks but a narrower notion of difference; the North Macedonian text offers a broader notion of difference but leaves teachers to translate it into each activity.

4.5 Two translations of a shared vocabulary: The findings point to two ways of turning similar reform commitments into curriculum text. The Turkish curriculum works through process, sequencing learning, describing the teacher's mediating work and embedding level-based differentiation, but often leaving unclear who is to act and in what context. The North Macedonian curriculum works through activity, naming students as actors, tying mathematics to concrete materials and setting out a broad view of inclusion, but saying little about the teacher after Grade 1, prior knowledge or roles beyond following instructions. This fits Steiner-Khamsi's (2014) observation that what ideas such as student-centred learning mean "in a given context varies widely" (p. 160), and Phillips and Ochs's (2003) account of how borrowed ideas are re-contextualised by a receiving system (pp. 456–457). This is not to claim that either curriculum borrowed from the other or from a single model. The comparison does suggest that two systems drawing on a common vocabulary in the same period produced recognisably different texts, partly because of textual form (sentence-based guidance attached to learning outcomes versus lists of activity examples) and not only because of pedagogical orientation.

5. Conclusions and recommendations

This study compared how the Grade 1–3 mathematics curricula of Türkiye and North Macedonia frame teaching and learning. Both supported meaning-making, relied heavily on concrete materials and linked mathematics to daily life, especially in measurement, money and time, but they placed agency and guidance differently. The Turkish curriculum set out an explicit learning sequence and attached differentiation to every learning outcome, yet often left the actor unnamed and daily-life contexts general. The North Macedonian curriculum made students the explicit actors of concrete activities and set out principles of inclusion and equity, yet mostly positioned students as following instructions and gave the teacher little visible role after Grade 1.

For curriculum developers, the Turkish text would be clearer if it named who carries out each suggested action, specified the situations behind references to daily life, placed producing and designing tasks in regular practice as well as under Enrichment, and addressed special educational needs and diversity alongside level-based support. The North Macedonian activity examples could describe the teacher's role in Grades 2 and 3, refer explicitly to prior knowledge and sequencing, include more tasks in which students explain, choose and design, and offer differentiated versions of at least some activities. In both countries, teacher guides and textbooks could carry much of this guidance.

Because the findings concern the intended curriculum, future research should examine classroom enactment, teachers' interpretations and the materials teachers actually use. The comparison could also be extended to Grade 4 once the Turkish curriculum reaches that level, and the coding strengthened through a human second coder and native-speaker review of the Macedonian documents.

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