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Evaluation of Mathematics Textbooks in Secondary Education in Morocco

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Research Article

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Abstract

Background/purpose. This study addresses the quality and effectiveness of mathematics textbooks used in Moroccan secondary levels, focusing on their overall alignment with official curriculum guidelines and their role in supporting student learning. The research was conducted to evaluate how well these textbooks meet educational standards and to identify potential areas for improvement.

Materials/methods. A 28-item survey was administered to 364 mathematics teachers across various Moroccan regions. The collected data were analyzed using descriptive statistics and Spearman's rho correlation to assess relationships among key textbook dimensions, including disciplinary content, pedagogical methods, and design features.

Results. The findings indicate that the textbooks are generally well-aligned with national curriculum standards and effectively present mathematical concepts. However, notable weaknesses were identified, particularly in interdisciplinary integration and the inclusion of exploratory learning activities. Issues related to visual design clarity were also highlighted.

Conclusion. The study concludes that while Moroccan secondary mathematics textbooks meet many curricular expectations, there is a critical need to enhance pedagogical strategies, foster interdisciplinary connections, and improve visual and structural design. These improvements are expected to have a strong influence on the quality and educational impact of mathematics textbooks in Moroccan schools.

1. Introduction

Textbooks play a central role in the educational process as they serve as the primary medium through which knowledge is transmitted to students. In mathematics education, textbooks not only present mathematical concepts but also organize the learning process, either inside the classroom or through autolearning process (Nhiry et .al,2023), helping students develop a deep understanding of complex topics, which plays a key role in motivating students to learn (El Qryefy et al.,2024). According to Rezat et al (2017), textbooks guide teachers and students through structured content, enabling systematic learning. In Morocco, mathematics textbooks are integral to secondary education, aligning with the pedagogical guidelines set by the Ministry of Education. However, the fact that mathematics teaching books in Morocco have not been systematically analyzed from a pedagogical perspective, especially in terms of how well they meet the educational needs of both teachers and students. Furthermore, mathematics textbooks play a crucial pedagogical role by structuring content delivery, guiding classroom instruction, and shaping students' conceptual understanding. In mathematics education, textbooks often serve as both a curriculum guide for teachers and a primary learning resource for students (Fan et al., 2013). As such, they significantly influence what is taught and how it is taught. Numerous content analyses have been conducted on mathematics textbooks to evaluate aspects such as the sequencing of concepts, the representation of problem types, and the alignment with curricular standards. Existing studies highlight the importance of textbook quality in the success of educational outcomes. For example, studies by Stein (2013) emphasize that textbooks should align with the national curriculum to ensure effective knowledge transfer. In Morocco, textbooks must adhere to pedagogical guidelines that foster critical thinking, problem-solving skills, and conceptual understanding (Nhiry et al.,2023).

Since the announcement of the framework law of education introducing significant changes in the teaching of scientific subjects, particularly the shift to instruction in foreign languages, many new textbooks have been developed and approved by the Ministry of Education. However, up to the time of this study, no evaluations of these textbooks, especially those used in scientific disciplines, have been conducted to our knowledge. This study aims to fill that gap by evaluating mathematics textbooks used in Moroccan schools and identifying the features that contribute to their improvement.

2. Literature Review

2.1. Textbook Evaluation in Education

Textbook evaluation is a crucial aspect of educational research, as textbooks serve as a primary resource for both teachers and students. Evaluating textbooks allows researchers to assess their effectiveness in supporting learning and achieving educational goals, particularly in scientific disciplines, given their significant impact on the global economy (Oulaydi et al., 2025; 2024). According to Brändström (2005), several frameworks have been developed for textbook evaluation, focusing on content quality, pedagogical methods, and assessment tools. These frameworks often evaluate the degree of alignment between textbooks and national curricula, the clarity and progression of content, and the integration of activities that promote critical thinking and problem-solving skills. In international contexts, studies by Stein et al (2001) and Okeeffe (2013) have used these frameworks to evaluate textbooks in various countries. These studies emphasize the importance of textbooks in providing structured guidance, examples, and exercises that foster student engagement and mastery of subject matter. For example, in the United States, textbook evaluations have focused on the clarity of explanations and the inclusion of real-life problems to connect academic knowledge with everyday life (Arthur et al, 2018). Similarly, in countries such as the UK and Germany, research has shown that textbooks that balance theory and practical application tend to improve student outcomes (Rezat et al, 2021). These international perspectives

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are particularly relevant to the Moroccan context, especially in light of recent reforms, where mathematics and science textbooks play a crucial role in achieving the objectives of the national curriculum.

2.2. The Role of Mathematics Textbooks

Mathematics textbooks are indispensable tools in mathematics education, as they help structure lessons, present examples, and guide students through complex mathematical concepts. According to Brehmer (2015), textbooks play a critical role in helping to foster mathematical thinking by providing structured, step-by-step explanations of concepts such as algebra, geometry, and calculus. Textbooks serve not only as sources of information but also as scaffolds for students, helping them build knowledge progressively from one topic to another through well-structured activities and exercises.

Several studies have highlighted the role of textbooks in addressing challenges faced by students in mathematics education. In particular, textbooks that provide clear explanations, relevant examples, and opportunities for practice help mitigate the challenges of learning abstract mathematical concepts (Okeeffe, 2011). However, poorly structured textbooks can exacerbate these difficulties by presenting information in a fragmented or confusing manner, which can hinder student comprehension and performance (Brändström, 2005). Which often results in learners being unable to construct knowledge independently or effectively follow the teacher's instructions.

2.3. Content Quality and Curriculum Alignment

Aligning textbooks with national curriculum standards is a fundamental criterion for evaluating textbook quality. Research has shown that textbooks that closely adhere to curriculum guidelines are more effective in supporting student learning (Stein et al, 2001). In the context of Morocco, where the national mathematics curriculum emphasizes key areas such as algebra, geometry, and analysis, textbooks that accurately reflect the curriculum's scope and sequence are essential for student success. According to Nhiry et al (2019), textbooks that align well with the curriculum help students develop a comprehensive understanding of mathematical concepts, which leads to better performance in assessments. Textbooks that cover topics such as algebra and geometry in a coherent and organized manner tend to promote deeper understanding among students. In contrast, textbooks that lack clear explanations or omit essential content may leave gaps in students' knowledge, making it harder for them to progress to more advanced topics (Arthur et al, 2018). This issue is particularly important in Morocco, where many students struggle with complex mathematical concepts that require a strong foundation in basic principles.

2.4. Pedagogical Methods in Textbooks

Textbooks that incorporate effective pedagogical methods contribute significantly to students' cognitive development. According to Brändström (2005), textbooks that promote problem-solving, inquiry-based learning, and interactive activities help develop students' critical thinking skills and mathematical reasoning. These pedagogical methods encourage students to actively engage with the material, ask questions, and explore mathematical ideas through practice and experimentation.

Incorporating interdisciplinary activities is another key aspect of effective textbooks. According to Rezat et al (2021), interdisciplinary projects that integrate mathematics with subjects such as physics, economics, and computer science help students see the real-world applications of mathematical concepts. These activities also foster a more holistic understanding of mathematics, demonstrating its relevance in everyday life (Nhiry et al., 2023). The inclusion of such activities is particularly beneficial for promoting engagement and deeper learning, as mentioned in the questionnaire evaluation.

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2.5. Textbook Design and Structure

The design and structure of a textbook are vital to its effectiveness in promoting learning. Studies have shown that well-organized textbooks, with clear headings, concise explanations, and a logical progression of topics, contribute to better comprehension and retention (Brehmer, 2015). Additionally, visual aids such as diagrams, graphs, and tables help students better understand complex concepts and make the material more accessible (Okeeffe, 2013). These visual elements are especially important in mathematics, where abstract concepts often require visual representation to facilitate understanding.

Furthermore, textbooks with a clean layout, well-designed illustrations, and legible text promote better readability and comprehension. According to Rezat (2017), textbooks that employ these design elements help students engage more effectively with the content, reducing cognitive load and improving their ability to retain and apply information.

2.6. Gaps in the Literature

Despite the wealth of research on textbook evaluation globally, there are few studies specifically examining mathematics textbooks in Morocco. While studies by researchers such as Brändström (2005) and Stein et al (2001) have provided valuable frameworks for evaluating textbooks, there is limited research that applies these frameworks to the Moroccan context. In particular, the lack of comprehensive studies on mathematics textbooks in Morocco means there is insufficient feedback on their effectiveness in supporting student learning and meeting curriculum objectives. This research will contribute to filling this gap by providing a detailed evaluation of mathematics textbooks used in Moroccan schools, with a focus on content, pedagogical methodology, and textbook design from various aspects such as evaluation, organization and design. By doing so, it will provide valuable insights for policymakers, curriculum designers, and educators seeking to improve mathematics education in Morocco. The review of existing literature emphasizes the importance of high-quality textbooks in enhancing mathematics education. Textbooks that are well-aligned with the curriculum, incorporate effective pedagogical strategies, and are designed to be accessible and engaging are critical in supporting students' mathematical learning. This study will build upon existing research by focusing on mathematics textbooks used in Morocco, contributing new insights into their quality and providing recommendations for improving their effectiveness in promoting student learning.

Mathematics education is often perceived as challenging due to the abstract nature of the subject. According to Brehmer (2015), textbooks are crucial in overcoming these challenges, as they provide clear explanations, guided examples, and problem-solving strategies. However, in Morocco, there is a lack of research concerning whether the newly designed mathematics textbooks adequately support students in mastering fundamental concepts and skills. Despite their importance, the existing literature on textbook evaluation in Morocco is vague, particularly concerning the quality of mathematics textbooks in secondary education. The lack of comprehensive evaluation means that educators and curriculum developers have limited feedback on how well textbooks align with learning goals and whether they adequately support diverse student needs and educational goals.

The main objective of this research is to evaluate the quality of mathematics textbooks used in secondary schools in Morocco, while also uncovering the correlations among the dimensions to enhance the textbooks. The study will assess several key dimensions of these textbooks, including content alignment, which examines the degree to which the textbooks adhere to official pedagogical and curriculum guidelines, clarity of concepts, focusing on the progression and clarity in the explanation of mathematical concepts; pedagogical methods, considering the inclusion of teaching strategies such as problem-solving and interdisciplinary activities; assessment and differentiation, evaluating the effectiveness of exercises and self-assessments in addressing students with varying abilities; and visual and structural design, which looks at the organization, layout, and use of visual

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aids such as diagrams, graphs, and tables. This research will offer valuable insights into the strengths and weaknesses of current mathematics textbooks and provide recommendations for their improvement based on the identified correlations among the various dimensions.

- To what extent does the content of mathematics textbooks used in secondary schools in Morocco align with official pedagogical guidelines, and how does this alignment impact student learning outcomes?

- How do the clarity, progression, and contextualization of mathematical concepts, as well as the inclusion of problem-solving, interdisciplinary activities, and differentiation strategies, contribute to the effectiveness of the textbooks for varying student abilities?

- What correlations exist amid the disciplinary content, design, clarity of content, and structure in mathematics textbooks, and how can these interconnected factors enhance the overall quality and effectiveness of the textbook?

3. Methodology

3.1. Research Design

This study utilized a quantitative research methodology to gather and analyze data from a sample of secondary mathematics teachers in Morocco. A carefully designed and refined questionnaire was employed to collect the teachers' perspectives on the most recent secondary mathematics textbooks. The primary aim of this research was to gain valuable insights into teachers' responses regarding the latest educational reforms in mathematics textbooks. By adopting this methodological framework, the study offers a thorough evaluation of the viewpoints of experienced teachers, enabling informed decision-making for future educational developments and guiding subsequent research directions.

3.2. Participants

The study involved 364 secondary mathematics teachers from various regions of Morocco, providing a diverse representation of the teaching population. In terms of age, 64.8% of participants were under 30 years old, 29.7% were between 30 and 39 years, and 5.5% were aged 40-49 years. Gender distribution was pretty balanced, with 53.8% female and 46.2% male participants. Regarding teaching experience, the majority (48.4%) had between 5-10 years of experience, followed by 41.8% with less than 5 years, and 9.9% with 11-20 years of experience. Participants taught across different educational cycles, with 67.0% teaching at the high school (Lycée) level and 33.0% at the middle school (Collège) level.

Geographically, the teachers were spread across several regions, with the largest groups from L'Oriental (30.8%), Fès-Meknès (14.3%), and Rabat-Salé-Kénitra (18.7%). Regarding involvement in textbook selection, 34.1% of the teachers participated in the initial selection process, while 65.9% did not. This diverse sample offers valuable insights into the current secondary mathematics textbooks and their effectiveness in various educational contexts.

3.3. Instrument

In this study, data on mathematics teachers' perceptions of mathematics textbooks were gathered using a 28-item survey questionnaire. The instrument was developed and subjected to a content validation process involving a panel of three experts and two experienced mathematics teachers.

The questionnaire was organized into four main sections and utilized a five-point Likert scale, ranging from 5 (Strongly Agree) to 1 (Strongly Disagree). The instrument demonstrated strong

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internal consistency, with a Cronbach's alpha coefficient of 0.902. The sections were structured as follows:

- The first section includes eight items collecting demographic details about the respondents, such as gender, age, teaching experience, mathematics textbook, type of professional degree.

- The Disciplinary Content section evaluates the alignment of the textbook with official curriculum guidelines, focusing on the clarity and progression of mathematical concepts. It assesses whether the content provides rigorous and accessible demonstrations suited to students' levels, ensures correct use of mathematical language (notation, symbols, vocabulary), and introduces connections between different branches of mathematics, such as algebra, geometry, and analysis.

- The Methodology and Learning section examines the textbook's approach to fostering student engagement and learning. It evaluates whether the exercises are progressive, varied, and categorized by difficulty, and whether the textbook promotes problem-solving and logical reasoning. The section also looks at the inclusion of activities that encourage discovery, manipulation, or exploration, such as dynamic geometry and the use of digital tools. Additionally, it assesses whether the textbook offers interdisciplinary projects or activities, integrating subjects like mathematics with physics, economics, or computer science.

- The Evaluation, Organization, and Language section focuses on the structure and usability of the textbook. It assesses whether the textbook includes self-assessments, chapter summaries, or competency grids, and whether the exercises allow for differentiation based on students' levels. The section also examines the logical and progressive organization of the chapters, as well as the clarity and organization of definitions, theorems, and properties. It evaluates the effectiveness of graphics, figures, and tables in enhancing understanding and considers whether the overall layout supports reading and comprehension. Additionally, this section explores the potential need for revisions to optimize the textbook's pedagogical use and evaluates the impact of language choice, specifically whether the use of French or English enhances students' learning.

3.4. Procedure and Sampling

The questionnaire was administered online to Moroccan mathematics teachers following its development and validation. It was distributed through well-established online platforms and professional groups, which experienced mathematics teachers regularly frequent. A convenience sampling approach was employed, whereby participants were selected based on their accessibility and willingness to engage in the study. The data collection period spanned one week, from April 22nd to April 28th, 2025. This approach ensured a timely and efficient data gathering process, leveraging the active participation of teachers in online communities dedicated to mathematics education.

3.5. Data Analysis

The statistical analysis focused on the responses collected through the questionnaire. First, descriptive statistics were computed to summarize the demographic characteristics of the participants, including age, years of teaching experience, and subject specialty. These measures provided an overview of the sample's composition. To explore participants' perceptions regarding the evaluation criteria of mathematics textbooks, the mean and standard deviation were calculated for each survey item. This allowed for the identification of central tendencies and variability across responses.

Furthermore, Spearman's rank-order correlation coefficients (ρ) were used to examine the relationships between the sub-dimensions within each section of the questionnaire. This non-parametric test was appropriate given the ordinal nature of Likert-scale data and the non-normal distribution of responses. The aim was to identify potential associations among the dimensions of

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textbook evaluation, such as content accuracy, pedagogical coherence, contextual relevance, and alignment with curriculum standards. All analyses were performed using [name of software, e.g., SPSS version XX], and statistical significance was evaluated at the 0.05 level.

4. Results

In the following section, we will present the findings based on the responses to the 28-item questionnaire administered to mathematics teachers. The survey questions are numbered from Q1 to Q19, and these items correspond to specific aspects of the textbooks being evaluated. Throughout the analysis, we will refer to these items using their respective identifiers (e.g., Q1, Q2, ..., Q19) for clarity. A detailed list of the survey items, including their corresponding content, can be found in the Appendix below for reference. This allows for a direct comparison between the question numbers used in the analysis and the specific areas of evaluation being discussed.

4.1. Disciplinary Content

Descriptive statistics for questions related to the quality and coherence of the disciplinary mathematical content (Q1–Q6) are summarized in Table 1. The mean ratings range from 3.22 to 3.74, showing generally favorable perceptions of the textbook's alignment with curriculum guidelines and the clarity of mathematical language. The highest-rated item was Q4 (use of mathematical language), with a mean of 3.74 (SD = 1.18), followed by Q1 (alignment with curriculum), with a mean of 3.69 (SD = 1.07). These results suggest a strong overall perception that the textbook effectively communicates mathematical concepts and adheres to the official curriculum guidelines. Spearman's rho correlations between items Q1 through Q6 show notable relationships, particularly between Q1 and Q4 (ρ = 0.727), and Q2 and Q3 (ρ = 0.551), demonstrating that curriculum alignment, the clarity of the mathematical language, and conceptual rigor are perceived to be strongly interconnected.

Table 1. Heatmap of Spearman's rho correlation results of disciplinary content section

Items	Q1	Q2	Q3	Q4	Q5	Q6
Q1-	1	0,542	0,495	0,727	0,362	0,544
Q2	0,542	1	0,551	0,527	0,424	0,441
Q3	0,495	0,551	1	0,439	0,317	0,48
Q4	0,727	0,527	0,439	1	0,29	0,392
Q5	0,362	0,424	0,317	0,29	1	0,432
Q6	0,544	0,441	0,48	0,392	0,432	1

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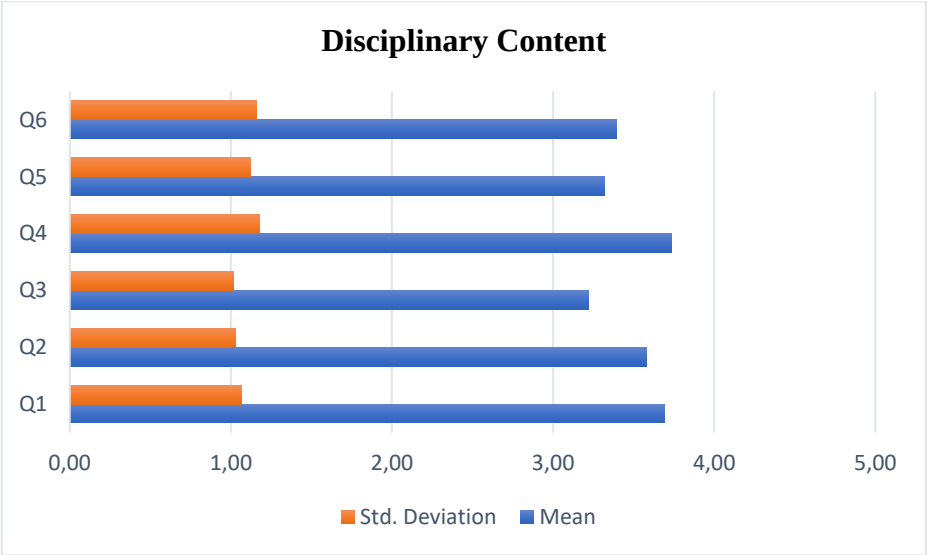

Figure 1. Mean and Standard Deviation of Disciplinary Content Responses

4.2. Methodology and Learning

Table 2 provides a summary of the results for items Q7–Q10, which assess pedagogical methodology, including exercises, reasoning, and interdisciplinary activities. Mean scores for these items range from 3.07 to 3.79, with the highest rating given to Q8 (promotion of logical reasoning), which received a mean of 3.79 (SD = 1.10). The lowest score was for Q10 (interdisciplinary activities), with a mean of 3.07 (SD = 1.13). Moderate positive correlations were observed between Q7 and Q8 (ρ = 0.520) and between Q9 and Q10 (ρ = 0.469), indicating that exercises promoting logical reasoning are closely linked to the structuring of tasks and activities that support problem-solving.

Table 2. Heatmap of Spearman's rho correlation results of Methodology and learning section

	Q7	Q8	Q9	Q10
Q7	1	0,52	0,313	0,208
Q8	0,52	1	0,403	0,243
Q9	0,313	0,403	1	0,469
Q10	0,208	0,243	0,469	1

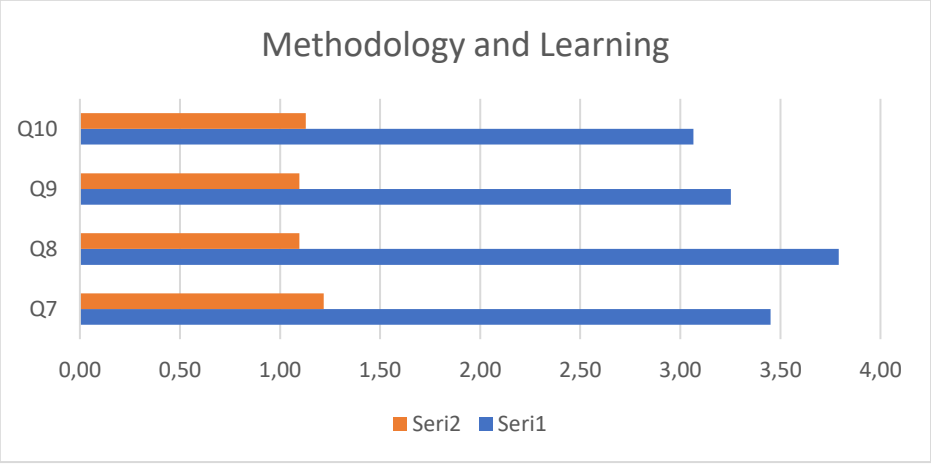

Figure 2. Mean and Standard Deviation of Methodology and Learning Responses

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4.3. Evaluation, Organization, and Language

Items Q11–Q19 address various aspects of the textbook's structure, evaluation tools, visual aids, and the language of instruction. Figure 3 illustrates these items, highlighting key components such as the clarity of definitions, the organization of content, and the language choices. Among the items, the highest-rated were Q14 (highlighting of definitions and theorems) with a mean of 3.85 (SD = 1.10) and Q16 (page layout clarity) with a mean of 3.77 (SD = 1.07). These ratings suggest that teachers highly value clear presentation and well-organized content in textbooks. Conversely, Q18 and Q19, which concern the use of French and English in the textbook, received significantly lower ratings, with Q19 (benefit of English) having the lowest mean score of 2.41 (SD = 1.41). This indicates a degree of discomfort or dissatisfaction with the use of English as a medium of instruction in the textbooks, particularly in a multilingual educational setting.

Correlations between structural and evaluative items, as shown in Table 3, reveal strong positive relationships, particularly between Q14 and Q15 (ρ = 0.582) and Q15 and Q16 (ρ = 0.628). These correlations suggest that teachers view clarity in definitions and theorems as closely tied to effective visual design and overall textbook organization. Interestingly, a negative correlation was observed between language preference (Q19) and structural quality items, which implies that participants may perceive the use of English as a barrier to comprehension, especially in multilingual educational contexts. This finding highlights the need for further investigation into the role of language in textbook effectiveness, particularly in diverse linguistic environments.

Table 3. Heatmap of Spearman's rho correlation results of Evaluation, Organization, and Language

	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19
Q11	1	0,408	0,449	0,561	0,57	0,477	0,354	-0,272	-0,254
Q12	0,408	1	0,552	0,275	0,509	0,532	0,195	0,309	0,15
Q13	0,449	0,552	1	0,488	0,486	0,6	0,262	-0,01	-0,116
Q14	0,561	0,275	0,488	1	0,582	0,55	0,395	-0,321	-0,255
Q15	0,57	0,509	0,486	0,582	1	0,628	0,425	0,041	0,02
Q16	0,477	0,532	0,6	0,55	0,628	1	0,206	0,072	-0,013
Q17	0,354	0,195	0,262	0,395	0,425	0,206	1	-0,036	-0,115
Q18	-0,272	0,309	-0,01	-0,321	0,041	0,072	-0,036	1	0,571
Q19	-0,254	0,15	-0,116	-0,255	0,02	-0,013	-0,115	0,571	1

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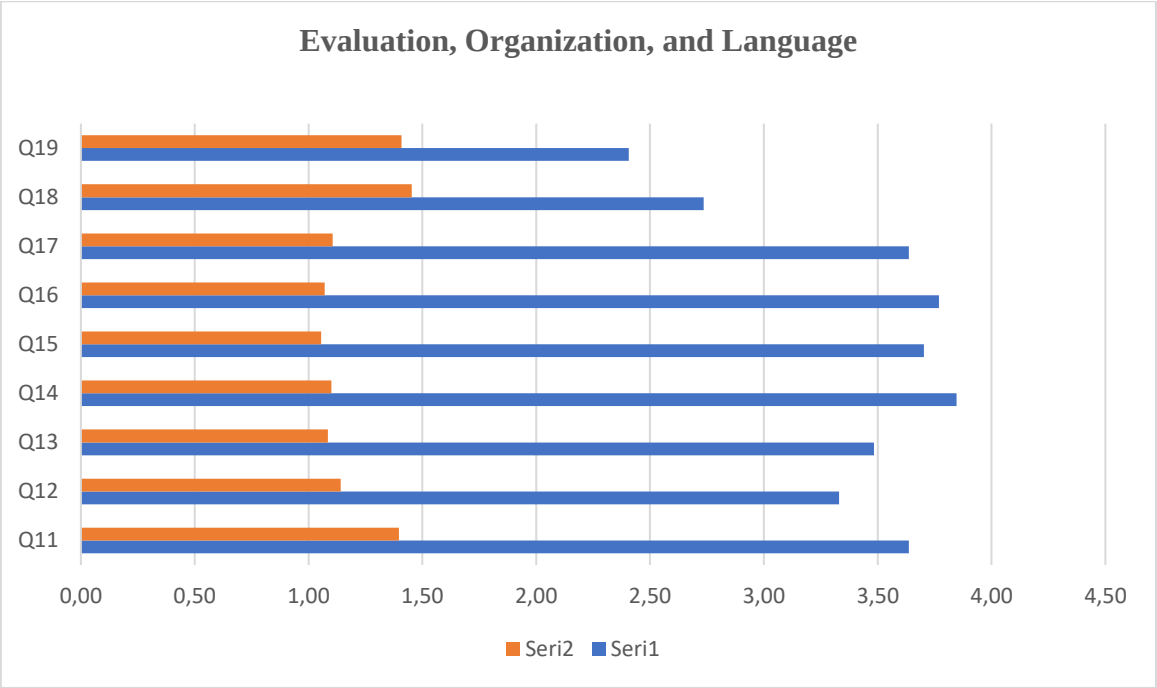

Figure 3. Mean and Standard Deviation of Evaluation, Organization, and Language

5. Discussion

The findings of this study highlight several important aspects of textbook quality in the context of mathematics education. Participants generally expressed favorable views toward the disciplinary content, with relatively high ratings for curriculum alignment, clarity of mathematical language, and the logical structure of definitions and theorems. These observations are providing positive feedback on the current textbooks, and their probable positive impact is consistent with prior research indicating that the alignment of instructional materials with curricular goals significantly supports conceptual understanding and student performance (Stein, Remillard, & Smith, 2007). Furthermore, the significant Spearman correlations observed among content items, such as between curriculum conformity and use of correct mathematical language ($\rho = .727$), reinforce the idea that coherence in content delivery is central to effective pedagogy. This finding supports the notion of internal alignment within textbooks, which Ball and Bass (2000) suggest is critical for fostering a deep mathematical understanding.

In terms of methodology and pedagogical practices, participants valued exercises that promote reasoning and logical thinking, with moderate correlations indicating a positive link between progressive structuring of tasks and cognitive engagement ($\rho = .520$). These results resonate with the work of Hiebert et al. (2005), who emphasized that well-designed tasks and sequencing of exercises play a pivotal role in advancing mathematical thinking. However, scores for interdisciplinary components and exploratory learning activities were lower, suggesting that while the manual is strong in traditional content delivery, it may not sufficiently support inquiry-based learning or cross-disciplinary integration. This echoes findings from Nicol et al. (2011), who argue that the inclusion of modelling and real-life applications enhances student motivation and deeper learning but is often underrepresented in conventional textbooks.

Regarding textbook evaluation and structure, high ratings were given to visual clarity and the organization of concepts (Q14–Q16), consistent with Mayer's (2005) cognitive theory of multimedia learning, which stresses the importance of clear visual design in facilitating comprehension. The strong correlations among structural elements further confirm that design quality is perceived as integral to instructional effectiveness. Interestingly, participants expressed mixed opinions on the

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role of language in instruction. Lower scores for the potential of English as a more effective medium of instruction, but does not necessarily suggest a strong preference or comfort with French, considering the unfavourable results for both languages. The negative correlations observed between language preference and certain structural quality items (e.g., Q14 and Q19, $\rho = -.255$) suggest that shifts in the language of instruction may be perceived as disruptive rather than supportive of learning—an issue similarly reported in other multilingual educational contexts (Brock-Utne, 2007). This finding underscores the need for careful, context-sensitive reforms and further empirical investigation in the Moroccan context before the Ministry of Education implements any language-related policy changes. Overall, while the evaluated textbook shows strong alignment with disciplinary content and structural coherence, it exhibits notable weaknesses in fostering interdisciplinary connections and exploratory learning. These findings highlight the need for systemic reorganization of textbook content and structure, ensuring not only academic rigor but also the integration of learner-centered and cross-disciplinary pedagogies. Future textbook development should therefore adopt a more holistic approach that balances foundational knowledge with cognitive flexibility and contextual relevance.

6. Conclusion

In conclusion, this study highlights the strengths and weaknesses of mathematics textbooks used in secondary schools in Morocco. The textbooks were positively rated for their alignment with the official curriculum, clarity of mathematical language, and logical structure of definitions and theorems, supporting prior research on the importance of curriculum alignment for student performance. Correlations between curriculum conformity and the correct use of mathematical language emphasize the need for coherence in content delivery. While the textbooks promote reasoning and logical thinking through progressive exercises, there were gaps in interdisciplinary and exploratory activities, indicating that the textbooks excel in traditional content delivery but fall short in fostering inquiry-based learning. High ratings for visual clarity and organization align with cognitive theories of multimedia learning, highlighting the importance of clear design, which has an important impact on both students and practitioners in the classroom and Self-directed learning. Furthermore, participants showed no preference for a particular language of instruction, with negative correlations suggesting that shifting to French or English may disrupt the learning experience. In summary, while the textbooks show strong alignment in content and structure, there is room for improvement in integrating interdisciplinary learning and exploratory activities, providing valuable insights for future textbook development.

7. Suggestion

Future research should include a more diverse sample of teachers and explore the perspectives of both students and educators. Larger samples would also be beneficial to allow for comparisons between different textbooks and regions. Longitudinal studies could track changes in textbook perceptions over time. Additionally, examining the role of language in textbook effectiveness, especially in multilingual contexts like Morocco, would be valuable for future studies. Expanding these areas will offer a more comprehensive understanding of the textbooks' impact.

8. Limitations

This study has a few limitations. The use of a convenience sample, mainly from online communities, may limit the generalizability of the results. Additionally, the sample was predominantly younger teachers, which may not fully capture the views of more experienced educators. The reliance on self-reported data could introduce biases, and the study focused only on teachers' perspectives, excluding students and textbook authors. Furthermore, the study was conducted within a specific timeframe, and perceptions may evolve.

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Declarations

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Appendix I.

Survey Questionnaire Items

	I-Disciplinary Content
Q1	Is the content of the manual in line with the pedagogical guidelines of the official curriculum?
Q2	Are the mathematical concepts explained in a clear and progressive way?
Q3	Does the manual offer rigorous and accessible demonstrations according to the students' level?
Q4	Is the mathematical language correctly used (notation, symbols, vocabulary)?
Q5	Does the manual introduce connections between the different branches of mathematics (algebra, geometry, analysis, etc.)?
Q6	Are the examples and problem situations proposed relevant and contextualized (real-life problems, modeling)?
	II- Methodology and learning
Q7	Are the exercises progressive, varied, and categorized by difficulty?
Q8	Does the manual promote problem-solving and logical reasoning?
Q9	Are there activities for discovery, manipulation, or exploration (dynamic geometry, digital tools)?
Q10	Does the manual offer interdisciplinary projects or activities (math + physics, economics, computer science…)?
	III- Evaluation, Organization and Language
Q11	Does the manual contain self-assessments, chapter summaries, or competency grids?
Q12	Do the exercises allow differentiation according to students' levels?
Q13	Is the structure of the chapters logical and progressive?
Q14	Are the definitions, theorems, and properties clearly highlighted and well-organized?
Q15	Are the graphics, figures, and tables clear, readable, and well-utilized?
Q16	Does the general layout facilitate reading and comprehension?
Q17	Does the manual require revisions or improvements to optimize its pedagogical use?
Q18	Does the use of the French language in the manual have a positive impact on students' learning?
Q19	Would the use of the English language have a more positive impact on students' learning?