

A CONTENT ANALYSIS OF GENDER REPRESENTATION IN AN INDONESIAN 7TH-GRADE MATHEMATICS TEXTBOOK

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Abstract

This study analyzes gender representation in a 7th-grade Indonesian mathematics textbook, addressing a critical gap in local research. This analysis is set against a backdrop of global findings on textbook bias and Indonesia's poor performance on national gender equality rankings. Textbooks play a crucial role in transmitting social values, including those related to gender equality, which is a key Sustainable Development Goal (SDG 5). Using a descriptive qualitative content analysis, this study coded content for character presence, activity settings, and professions. High inter-rater reliability was achieved (Cohen's Kappa = 0.88). The findings reveal significant biases: (1) Male characters (n=233) appeared over 2.3 times more frequently than female characters (n=101). (2) Female characters were disproportionately depicted indoors (n=81) versus outdoors (n=39), while males were more balanced (n=139 vs. n=111). (3) Male professions were overwhelmingly stereotypical (52 traditional vs. 2 non-traditional). (4) While the types of female professions were more balanced (11 traditional vs. 12 non-traditional), this positive aspect was undermined by their overall "invisibility." (5) Notably, zero female mathematicians were featured. The study concludes that the analyzed textbook actively reinforces gender stereotypes, fails to support SDG 5, and requires urgent revision by the Ministry of Education and Culture.

Keywords: gender representation, mathematics textbooks, gender stereotypes, content analysis, secondary education

Abstrak

Penelitian ini menganalisis representasi gender dalam buku teks matematika SMP kelas VII di Indonesia, untuk mengisi kesenjangan penelitian lokal terkait temuan global tentang bias gender dalam buku teks dan peringkat kesenjangan gender Indonesia yang masih rendah. Buku teks berperan penting dalam menanamkan nilai-nilai sosial, termasuk kesetaraan gender yang merupakan bagian dari Tujuan Pembangunan Berkelanjutan (SDG 5). Menggunakan metode kualitatif deskriptif (analisis konten), penelitian ini mengkode konten berdasarkan kehadiran karakter, latar aktivitas, dan profesi, dengan reliabilitas antar-koder yang "Sangat Baik" (Cohen's Kappa = 0.88). Temuan menunjukkan bias yang signifikan: (1) Karakter pria (n=233) muncul 2,3 kali lebih sering daripada karakter wanita (n=101). (2) Karakter wanita secara tidak proporsional digambarkan di dalam ruangan (n=81) dibanding di luar ruangan (n=39), sementara pria lebih seimbang (n=139 vs. n=111). (3) Profesi pria sangat stereotip (52 tradisional vs. 2 non-tradisional). (4) Meskipun jenis profesi wanita lebih seimbang (11 tradisional vs. 12 non-tradisional), dampaknya berkurang karena "invisibilitas" atau jarang mereka kemunculan. (5) Terlebih lagi, tidak ada satupun ilmuwan matematika perempuan yang ditampilkan. Studi ini menyimpulkan bahwa buku teks yang dianalisis secara aktif memperkuat stereotip gender, gagal mendukung SDG 5, dan memerlukan tinjauan serta revisi mendesak oleh Kementerian Pendidikan dan Kebudayaan.

Kata kunci: representasi gender, buku teks matematika, gender stereotype, konten analisis, pendidikan menengah,

INTRODUCTION

Research related to gender issues in mathematics in the Western world has been examined from various perspectives, such as mathematical ability, textbooks, and mathematical learning (Tang et al., 2010). Findings from research on gender analysis in textbooks worldwide, from the 1970s to the 2020s, have highlighted similar problems. These

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issues include: (1) the presence of female figures or characters is less than that of male figures or characters; (2) professions depicted for male and female characters are based on societal stereotypes, e.g., men as doctors, lawyers, and pilots, while women are depicted as waitresses, nurses, and flight attendants; (3) types of activities depicted for male and female characters are based on societal stereotypes, e.g., men engaging in sailing, mountain climbing, and sculpting, while women are shown sewing, cooking, and performing other household chores; (4) female scientists are not featured; (5) female characters are depicted with passive, tearful, and timid traits, compared to male characters who are active, strong, and brave; and (6) male characters are highly dominant in outdoor activities, while female characters are more prominently featured in indoor activities (Biemmi, 2015; Caldwell & Wilbraham, 2018; Kuhnke, 1977; Tang et al., 2010; Ullah et al., 2017).

Textbooks play a crucial role in teaching and learning activities. To this day, textbooks remain the most affordable teaching media available. A textbook contains written material and illustrations intended to achieve specific learning objectives, typically exists as a hard copy, and serves as the primary source linking the curriculum syllabus with student learning activities (Brugeilles & Cromer, 2009a; Glasnovic Gracin, 2018; Özgeldi & Esen, 2010). Additionally, textbooks foster independent learning, allowing students to revisit concepts and explore topics at their own pace. Textbooks not only contribute to learning through the dissemination of knowledge but also play an important role in children's character development by directly or indirectly transmitting models of social behaviors, norms, and values. One of the values that should be prioritized is the effort to combat gender inequality. This value is essential as the theme of gender equality is part of the Sustainable Development Goals (SDGs), specifically Goal 5: "Achieve gender equality and empower all women and girls" (UN General Assembly, 2015).

In the Indonesian context, the 2022 SDGs Gender Index ranks Indonesia 78th, labeling its progress on gender equality between 2015 and 2020 as "poor" (Equal Measures 2030, 2022). Similarly, the World Economic Forum's Global Gender Gap Report 2023 placed Indonesia 87th, with a gender parity score of 0.697 (less than 1), indicating a disparity that favors males in Indonesia (Global Gender Gap Report 2023, 2023).

Data from other countries show that textbooks are indeed not immune to gender bias. In India, the representation of females in textbooks was only 32.4% (compared to 57.1% for

males). In Spain, a 3rd-grade mathematics textbook showed a comparison of 46.57% female and 53.43% male representation. In terms of roles, females in Indian textbooks were dominant in childcare (95.7%) and family roles (57.4%). In Spanish textbooks, vertical segregation was evident, with male characters holding higher occupational positions (bosses, directors) at 69.23% compared to female characters (30.77%) (Guichot-Reina & De La Torre-Sierra, 2023; Košir & Lakshminarayanan, 2023).

Although international findings and national data highlight the urgency of this problem, research related to the analysis of mathematics textbooks based on gender and culture in Indonesia is still rare. Therefore, this research is conducted to fill this gap. This study seeks to answer the following research questions:

1. What is the difference in the presence of male and female characters in the analyzed textbook?
2. How is the distribution of activities (indoors and outdoors) for male and female characters in the analyzed textbook?
3. How is the distribution of professions depicted for male and female characters in the analyzed textbook?

METHODS

This study utilizes a descriptive qualitative research design, focusing on document analysis (Cohen et al., 2007). The analysis involves identifying, selecting, investigating, categorizing, and coding content from the document that pertains to gender concepts. Subsequently, the results of this investigation are compared based on the established categories and summarized descriptively. The document analyzed in this study is a 7th-grade mathematics textbook published by the Indonesian Ministry of Education and Culture (Kemendikbud). The specific textbook is the BSE Matematika Kelas VII Kurikulum 2013 Revisi 2016 (Semester 1 and 2). This textbook was selected due to its widespread use in public schools and its official sanction by the government.

The researcher first developed a coding scheme for the characteristics under investigation, designed to simplify the classification of findings. To answer the first research question (presence of characters), the researcher classified gender-related content (such as information, example problems, or exercises) into four categories:

- "Male": Content depicting an activity performed by one or more males.

- "Female": Content depicting an activity performed by one or more females.
- "Together": Content depicting males and females participating in an activity simultaneously.
- "Non-gender": Content depicting a person or group without specifying any gender preference.

The next set of codes was used to answer the second research question (distribution of activities). The researcher divided activities into two categories:

- "Indoor": The activity performed by a male or female took place indoors.
- "Outdoor": The activity took place outdoors.

The final set of codes addressed the third research question (professions). These codes were "Traditional" and "Non-Traditional":

- "Traditional": A male or female performed an activity or held a profession that aligned with conventional gender stereotypes.
- "Non-Traditional": A male or female performed an activity or held a profession that was contrary to these stereotypes.

Following the development of the coding scheme, all relevant content within the textbook was analyzed and classified according to these codes. The reliability in this study was established using Cohen's Kappa to test inter-rater reliability. This test was chosen because two coders were used to analyze the nominal data. Based on the Cohen's Kappa calculation, the score for inter-rater reliability was 0.88, which is interpreted as a "Very Good" level of agreement between the two coders.

RESULTS AND DISCUSSION

The content analysis yielded significant findings related to gender representation, which are discussed in order of the research questions. The first research question addressed the difference in the presence of male and female characters. The analysis revealed a significant imbalance in representation. As shown in Table 1, male characters appeared more than 2.3 times as frequently as female characters.

Table 1. Frequency of Gendered Character Representation

Category	Semester 1	Semester 2	Total	Percentage
Male	105	128	233	66.4%
Female	48	53	101	28.8%
Together	15	16	31	8.8%
Non-gender	40	46	86	(n/a)
Total (Gendered)	168	197	365	100%
<i>Note: The "Non-gender" category is excluded from the percentage calculation to show the ratio of gendered appearances.</i>				

This disparity was consistent across both semesters. This finding shows the significant underrepresentation of female characters. This "invisibility" reinforces the findings of Ullah et al. (2017) and others, indirectly communicating that mathematics and the contexts it applies to (e.g., problem-solving, professional life) are predominantly male domains.

The second research question examined the settings for male and female activities. The analysis revealed a strong reinforcement of the "indoor/outdoor" stereotype. While male characters dominated in sheer frequency in both settings, their distribution was relatively balanced. In sharp contrast, female characters were disproportionately confined to indoor settings (see Table 2).

Table 2. Distribution of Character Activity Settings by Gender

Gender	Indoor	Outdoor	Total	Indoor-to-Outdoor Ratio
Male	139	111	250*	~1.25 : 1
Female	81	39	120*	~2.1 : 1
<i>Note: The total counts (250, 120) in this table represent the sum of all activities, which may differ slightly from total character appearances (233, 101) if a single character was involved in multiple activities or no activity.</i>				

Notably, the ratio of indoor-to-outdoor activities for women (2.1:1) was far more skewed toward indoor settings than the ratio for men (1.25:1). This reinforces traditional gender roles, associating men with public, active, and outdoor pursuits and women with private, domestic, or indoor-bound activities (Caldwell & Wilbraham, 2018).

The final research question analyzed the types of professions depicted for each gender. The data, summarized in Table 3, presents a nuanced picture. Male Professions: A total of 52

types of professions for men were classified as "Traditional" (e.g., Peternak Ayam / Chicken Farmer, Ilmuwan / Scientist, Atlet / Athlete). In sharp contrast, only 2 types were "Non-traditional" (e.g., Koki / Cook, Penjahit / Tailor). Female Professions: For women, 11 types of professions were "Traditional" (e.g., Pelayan / Waitress, Perawat / Nurse, Perancang Busana / Fashion Designer). Conversely, 12 types were "Non-traditional" (e.g., Atlet / Athlete, Nutrisionis / Nutritionist, Pengusaha Kue / Cake Entrepreneur).

Table 3. Classification of Depicted Professions by Gender and Stereotype

Gender	Traditional	Non-Traditional	Total Types
Male	52	2	54
Female	11	12	23

This analysis shows that while men were depicted in a much wider variety of professions overall (54 types vs. 23 for women), their roles were overwhelmingly stereotypical (a 52:2 ratio). For male characters, the representation is extremely rigid, suggesting a very narrow depiction of masculinity.

For female characters, the data is mixed. The presence of 12 non-traditional professions suggests a conscious effort to include modern roles for women, which is a positive sign. However, this finding is severely undermined by the first finding: overall invisibility. While the types of non-traditional roles exist, their impact is diluted because female characters of any kind are rare. A few non-traditional examples cannot counteract the overwhelming message sent by the sheer volume of male-centric content.

One feature of the analyzed textbook is a "Mathematician" profile linked to the material in a given chapter. For example, when introducing the topic of Integers, the mathematician featured is Leonardo da Pisa. Across the entire textbook (8 chapters, both semesters), not a single female mathematician was featured. This is a profound missed opportunity. For example, Mary Everest Boole (1832-1916) conceptualized cooperative learning in mathematics and focused on Algebra. Florence Nightingale (1820-1910) was a pioneer of applied statistics in health, and her "Diagram of the Causes of Mortality" (see Figure 3) is a prime example of data presentation. Both of these mathematicians are highly deserving of being featured, especially for the topics of Algebra and Data Presentation (Statistics).

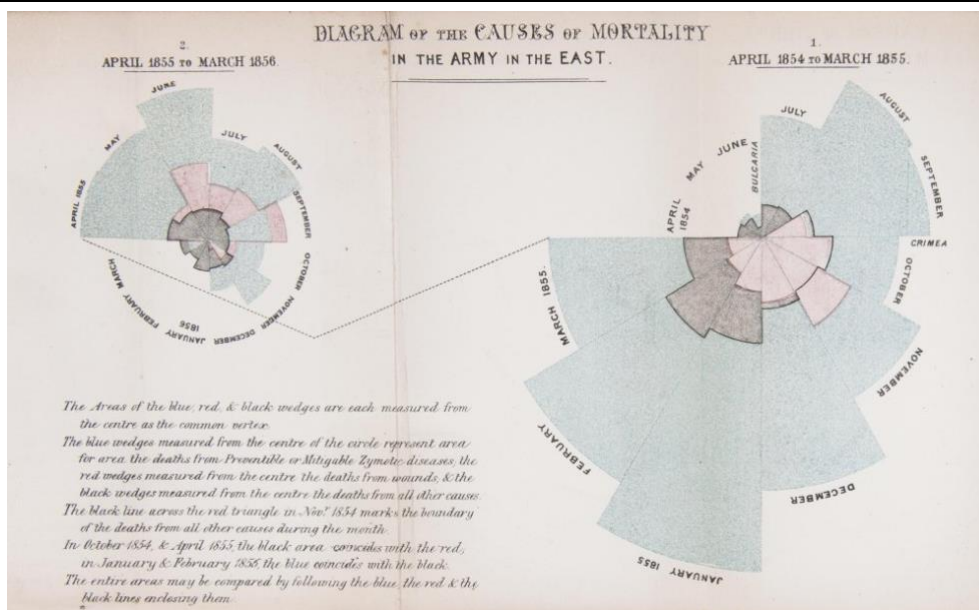


Figure 1. Florence Nightingale's "Diagram of the Causes of Mortality," 1858.

CONCLUSION

This study confirms that research on gender in Indonesian textbooks is urgently needed. The analyzed 7th-grade mathematics textbook fails to promote gender equality and, in many ways, actively reinforces the stereotypes that contribute to Indonesia's poor performance on national gender gap indices (Global Gender Gap Report 2023, 2023). The study shows that female characters are largely invisible, and when they do appear, they are often confined to indoor settings. The textbook misses a critical opportunity to support SDG 5 (Gender Equality). Instead, it communicates to students, both male and female, that mathematics and the wider world of public and professional life are predominantly male domains. The findings suggest a need for a critical review and revision of all educational materials by the Ministry of Education and Culture to ensure they reflect and, more importantly, promote a more equitable society for the next generation of Indonesians.

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REFERENCES

- Biemmi, I. (2015). The imagery of gender in Italian textbooks. Research into primary school books. *Foro de Educación*, 13(18), 15–35. <https://doi.org/10.14201/yhgvfp97>
- Brugeilles, C., & Cromer, S. (2009). Promoting gender equality through textbooks: A methodological guide. United Nations Educational, Scientific and Cultural Organization. https://unesdoc.unesco.org/ark:/48223/pf0000158897_eng
- Caldwell, E. F., & Wilbraham, S. J. (2018). Hairdressing in space: Depiction of gender in science books for children. *Journal of Science & Popular Culture*, 1(2), 101–118. https://doi.org/10.1386/jspc.1.2.101_1
- Cohen, L., Manion, L., & Morrison, K. (2007). *Research Methods in Education* (6th ed.). Routledge. <https://doi.org/10.4324/9780203029053>
- Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Pearson.
- De La Caba Collado, M., & López Atxurra, R. (2006). Democratic citizenship in textbooks in Spanish primary curriculum. *Journal of Curriculum Studies*, 38(2), 205–228. <https://doi.org/10.1080/00220270500153823>
- Else-Quest, N. M., Hyde, J. S., & Linn, M. C. (2010). Cross-national patterns of gender differences in mathematics: A meta-analysis. *Psychological Bulletin*, 136(1), 103–127. <https://doi.org/10.1037/a0018053>
- Equal Measures 2030. (2022). *Equal Measures 2030—‘Back to Normal’ is Not Enough: The 2022 SDG Gender Index*. Equal Measures 2030.
- Fan, L. (2013). Textbook research as scientific research: Towards a common ground on issues and methods of research on mathematics textbooks. *ZDM*, 45(5), 765–777. <https://doi.org/10.1007/s11858-013-0530-6>
- Fan, L., Zhu, Y., & Miao, Z. (2013). Textbook research in mathematics education: Development status and directions. *ZDM*, 45(5), 633–646. <https://doi.org/10.1007/s11858-013-0539-x>
- Gay, L. R., Mills, G. E., & Airasian, P. W. (2012). *Educational research: Competencies for analysis and applications* (10th ed.). Pearson.
- Glasnovic Gracin, D. (2018). Requirements in mathematics textbooks: A five-dimensional analysis of textbook exercises and examples. *International Journal of Mathematical*

- Education in Science and Technology, 49(7), 1003–1024.
<https://doi.org/10.1080/0020739X.2018.1431849>
- Global Gender Gap Report 2023. (2023). World Economic Forum.
- Guichot-Reina, V., & De La Torre-Sierra, A. M. (2023). The Representation of Gender Stereotypes in Spanish Mathematics Textbooks for Elementary Education. *Sexuality & Culture*, 27(4), 1481–1503. <https://doi.org/10.1007/s12119-023-10075-1>
- Iskandar, R. S. F., Raditya, A., & Pradipta, T. R. (2021). Analysis of mathematics problems in the 2013 curriculum and Cambridge curriculum mathematics textbooks. *Kalamatika: Jurnal Pendidikan Matematika*, 6(1), 99–110.
<https://doi.org/10.22236/KALAMATIKA.vol6no1.2021pp99-110>
- Košir, S., & Lakshminarayanan, R. (2023). Do visual constructs in social science textbooks evince gender stereotypes and bias? A case study from India. *Gender and Education*, 35(1), 69–88. <https://doi.org/10.1080/09540253.2022.2144626>
- Kuhnke, H. F. (1977). Update on Sex-Role Stereotyping in Elementary Mathematics Textbooks. *Arithmetic Teacher*, 24(5), 373–376.
- NIRAS, & CPM International. (2016). Preventing Gender Stereotypes and Promoting Gender Equality in School Textbooks and Materials: A Methodological Guide.
- Özgeldi, M., & Esen, Y. (2010). Analysis of mathematical tasks in Turkish elementary school mathematics textbooks. *Procedia - Social and Behavioral Sciences*, 2(2), 2277–2281.
<https://doi.org/10.1016/j.sbspro.2010.03.322>
- Tang, H., Chen, B., & Zhang, W. (2010). Gender Issues in Mathematical Textbooks of Primary Schools. *Journal of Mathematics Education*, 3(2), 106–114.
- Ullah, H., Abdullah, F., Ahmad, A., & Ali, R. (2017). Gender Representation in Mathematics Textbooks in Azad Jammu & Kashmir. *International Journal of Innovation in Teaching and Learning (IJITL)*, III(II), 1–17. <https://doi.org/10.35993/ijitl.v3i2.320>
- UN General Assembly. (2015). Transforming our world: The 2030 Agenda for Sustainable Development. UN General Assembly. <https://www.refworld.org/docid/57b6e3e44.html>
- UNESCO. (2021). Guidance Note for using Gender Equality Analysis Tools in the Jordanian National Curriculum Framework.