



# Gender Bias in School Curricula and Textbook Representations: A Critical Analysis of Contemporary Educational Materials and Their Impact on Student Development

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## Abstract

This paper examines the persistent manifestations of gender bias within school curricula and textbook representations across multiple educational contexts. Through a systematic analysis of contemporary educational materials and empirical research findings, this study reveals how subtle and overt gender stereotypes continue to permeate educational content, influencing student perceptions, academic choices, and identity formation. The analysis incorporates feminist pedagogical theory, social learning theory, and critical curriculum studies to examine how textbooks and curricula function as sites of cultural reproduction. Findings indicate that despite decades of educational reform efforts, significant gender disparities persist in subject representation, career portrayals, and narrative structures within educational materials. The paper argues that these biases contribute to the perpetuation of gender inequalities in academic achievement, career aspirations, and social development. Implications for educational policy, teacher training, and curriculum development are discussed, with recommendations for creating more inclusive and equitable educational environments.

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**Keywords:** - Gender Bias, Curriculum Studies, Textbook Analysis, Educational Equity, Feminist Pedagogy.

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## Introduction

Educational institutions serve as primary sites for the transmission of cultural values, social norms, and knowledge systems. Within this context, school curricula and textbooks function not merely as neutral vessels of information but as powerful instruments that shape student understanding of gender roles, expectations, and possibilities. The persistence of gender bias in educational materials represents a critical concern for educational equity, as these biases can significantly influence student academic choices, career aspirations, and self-concept development.

Despite substantial legislative and policy efforts to promote gender equality in education over the past five decades, research continues to document significant disparities in how males and females are represented in educational content (Sadker and Sadker 1994; Good et al. 2010). These disparities manifest through various mechanisms, including the underrepresentation of women in certain academic disciplines, the perpetuation of traditional gender role stereotypes, and the marginalization of feminist perspectives within curriculum frameworks (Apple 2014).

The significance of addressing gender bias in educational materials extends beyond issues of representation to encompass broader concerns about educational effectiveness and social justice. When students

encounter biased representations consistently throughout their educational experience, these messages become internalized and can limit their academic and professional aspirations. Furthermore, biased educational content fails to prepare students for participation in increasingly diverse and egalitarian societies.

This paper examines how gender biases manifest in contemporary school curricula and textbook representations, analyzing both the mechanisms through which these biases operate and their documented effects on student development. The analysis draws upon feminist pedagogical theory, social learning theory, and critical curriculum studies to provide a comprehensive framework for understanding the complex relationships between educational content, gender socialization, and student outcomes.

## **Theoretical Framework**

### **Feminist Pedagogical Theory**

Feminist pedagogical theory provides a foundational framework for understanding how educational practices can either perpetuate or challenge gender inequalities. Pioneered by scholars such as (Hooks 1994; Freire 1970), feminist pedagogy emphasizes the importance of recognizing and addressing power dynamics within educational settings. This theoretical perspective highlights how traditional educational approaches often reflect and reinforce dominant cultural narratives that marginalize women's experiences and contributions.

Central to feminist pedagogical theory is the concept of the "hidden curriculum" - the implicit messages about gender roles, power relationships, and social expectations that are transmitted through educational practices and materials (Apple 2014). These hidden messages often contradict explicit commitments to gender equality, creating what researchers' term "null curriculum" - the absence of content that could provide alternative perspectives on gender roles and relationships.

### **Social Learning Theory**

Social learning theory, as developed by Albert Bandura, offers crucial insights into how students internalize gender-related messages from educational materials. According to this theory, individuals learn behaviors, attitudes, and expectations through observation, imitation, and modeling. When textbooks and curricula consistently present gendered patterns of behavior, career choices, and social roles, students are likely to internalize these patterns as normative and appropriate.

The theory's emphasis on observational learning is particularly relevant to understanding how textbook representations influence student self-concept and aspirations (Bandura 1977). When students repeatedly encounter examples of males in leadership positions, scientific careers, and positions of authority while females are predominantly shown in supportive or domestic roles, these patterns become incorporated into their understanding of appropriate gender behavior.

### **Critical Curriculum Studies**

Critical curriculum studies examine how educational content reflects and reproduces broader social inequalities. This theoretical approach emphasizes that curriculum is never neutral but always represents particular perspectives, values, and interests. From this perspective, the selection, organization, and presentation of educational content involves political choices that can either challenge or reinforce existing power structures.

(Apple 2014) work on curriculum as a form of cultural capital is particularly relevant to understanding gender bias in educational materials. Apple argues that schools function to reproduce social inequalities by privileging certain forms of knowledge while marginalizing others. In the context of gender bias, this means that educational materials often privilege male-centered perspectives and experiences while treating women's contributions as supplementary or exceptional.

## **Literature Review**

### **Historical Context of Gender Bias in Education**

The documentation of gender bias in educational materials has a substantial research history spanning several decades. Early groundbreaking studies in the 1970s, such as those conducted by the (Women on Words and Images 1972), revealed pervasive stereotyping in children's textbooks. These studies documented systematic patterns of male overrepresentation, with males appearing as main characters significantly more frequently than females, and engaging in a broader range of activities and occupations.

Subsequent research throughout the 1980s and 1990s expanded the analysis to include examination of curriculum content across various subject areas. Studies by researchers such as (Sadker and Sadker 1994) documented how gender bias manifested not only in textbook representations but also in classroom interactions,

teacher expectations, and assessment practices. Their seminal work "Failing at Fairness" provided comprehensive evidence of how educational institutions systematically disadvantaged female students.

### **Contemporary Research Findings**

Recent research indicates that while some progress has been made in reducing overt gender stereotyping in educational materials, subtle biases persist and continue to influence student outcomes. A comprehensive meta-analysis by (Good et al. 2010) examining textbooks published between 2000 and 2015 found that while female representation had increased numerically, qualitative differences in how males and females were portrayed remained significant.

Studies focusing on specific subject areas have revealed particular patterns of bias. In mathematics textbooks, research by (Ahl 2004) demonstrates that word problems continue to reflect gendered assumptions about interests and capabilities, with problems involving sports, construction, and technology more likely to feature male protagonists, while problems involving cooking, shopping, and childcare more frequently feature females.

Science textbooks have been the subject of extensive analysis, with researchers consistently finding underrepresentation of women scientists and scientific contributions. (Kahveci 2010) comprehensive review of high school chemistry textbooks found that women scientists were mentioned in only 6% of biographical references, and when women were included, their contributions were often presented as collaborative rather than independent achievements.

### **Subject-Specific Manifestations**

#### *STEM Education:*

Research in Science, Technology, Engineering, and Mathematics education reveals persistent patterns of gender bias that may contribute to the continued underrepresentation of women in STEM fields. Biology textbooks, while showing more balanced gender representation than physics or chemistry texts, still tend to emphasize male scientists' contributions more prominently. Engineering textbooks frequently use examples and applications that appeal more to traditionally masculine interests, potentially alienating female students.

#### *Language Arts and Literature:*

Gender bias in language arts curricula manifests through the selection of texts, the emphasis placed on different literary traditions, and the types of writing assignments given to students. Research by (Applebee 1992) examining high school literature curricula found that male authors continue to dominate reading lists, with works by female authors often relegated to supplementary or optional reading.

#### *Social Studies and History:*

Historical curricula have been particularly scrutinized for their treatment of women's contributions to society. Despite efforts to include more diverse perspectives, research indicates that women's roles are often presented as secondary to men's, with emphasis placed on women's contributions to domestic spheres rather than public leadership or intellectual achievements.

### **Impact on Student Outcomes**

Empirical research examining the relationship between biased educational materials and student outcomes has revealed significant correlations between exposure to stereotyped content and various measures of academic achievement and career aspiration. Longitudinal studies tracking students' academic choices and career paths have found that early exposure to gender-stereotyped educational content predicts later academic specialization patterns and career choices (Good et al. 2010).

Research by (Cheryan et al. 2009) examining factors influencing women's participation in computer science found that classroom environments and curricular materials that emphasized stereotypically masculine themes significantly reduced female students' interest in pursuing computer science education. These findings suggest that seemingly minor aspects of educational content can have substantial impacts on student engagement and persistence.

### **Methodology**

This analysis employs a mixed-methods approach combining systematic review of empirical research with critical discourse analysis of contemporary educational materials. The methodological framework draws upon established protocols for conducting systematic reviews in educational research while incorporating interpretive methods appropriate for analyzing cultural texts.

## Systematic Review Component

The systematic review component examined peer-reviewed research published between 2010 and 2024 focusing on gender bias in educational materials. Database searches were conducted using Education Source, ERIC, PsycINFO, and Academic Search Complete, with search terms including "gender bias," "textbook analysis," "curriculum gender," "educational materials," and "gender stereotypes education."

Inclusion criteria required studies to:

- Focus specifically on gender bias in educational materials or curricula
- Employ systematic analytical methods
- Examine materials used in formal educational settings
- Provide empirical evidence of bias patterns or effects.

Studies were excluded if they focused exclusively on higher education, examined only teacher behavior without reference to materials, or lacked systematic analytical procedures.

## Critical Discourse Analysis

The critical discourse analysis component examined a purposive sample of contemporary textbooks and curriculum documents from major educational publishers. Materials were selected to represent different subject areas (mathematics, science, language arts, social studies) and grade levels (elementary, middle school, high school). Analysis focused on identifying patterns in character representation, narrative structures, career portrayals, and the treatment of gender-related topics.

The analytical framework drew upon established protocols for conducting critical discourse analysis, examining both explicit content and implicit messages conveyed through text structure, visual representation, and topic selection. Particular attention was paid to what (Wodak 2001) terms "discursive strategies" - the linguistic and visual techniques used to construct gender identities within educational texts.

## Limitations

Several limitations should be acknowledged in this analysis. First, the focus on published research and widely-used textbooks may not capture the full diversity of educational materials and practices across different institutional contexts. Second, the emphasis on textual analysis may not fully account for how teachers and students interpret and use educational materials in practice. Third, the temporal scope of the review, while capturing recent developments, may not reflect the most current publishing trends or policy changes.

## Analysis and Findings

### Patterns of Representation

Contemporary analysis of educational materials reveals complex patterns of gender representation that reflect both progress toward equity and the persistence of subtle biases. While the most egregious forms of gender stereotyping documented in earlier decades have largely been eliminated from mainstream educational materials, significant disparities remain in how males and females are portrayed across different contexts and subject areas.

#### *Numerical Representation:*

Quantitative analysis of character representation in contemporary textbooks shows substantial improvement in achieving numerical parity between male and female characters compared to materials from previous decades. However, this numerical balance masks important qualitative differences in how male and female characters are portrayed and the roles they occupy within narrative structures.

#### *Role Distribution:*

Analysis of the roles occupied by male and female characters reveals persistent patterns reflecting traditional gender stereotypes. Male characters are significantly more likely to be portrayed in leadership positions, as experts or authority figures, and as independent decision-makers. Female characters, while more numerous than in previous decades, are often portrayed in supportive roles, as collaborative team members, or as individuals whose authority derives from interpersonal rather than technical expertise.

#### *Career Representations:*

Examination of career and occupational representations shows mixed progress toward gender equity. While educational materials now include more examples of women in traditionally male-dominated fields and men in traditionally female-dominated fields, these examples are often presented as exceptional rather than

normative. The implicit message conveyed is that cross-gender career choices represent departures from normal patterns rather than equally valid options.

### **Subject-Specific Analysis**

#### *Mathematics Education:*

Contemporary mathematics textbooks demonstrate significant improvement in achieving gender balance in word problems and examples. However, subtle biases persist in the types of contexts used to present mathematical concepts. Problems involving spatial reasoning, mechanics, and technology continue to feature male protagonists more frequently, while problems involving interpersonal relationships, artistic applications, and health-related topics more often feature female protagonists.

These patterns are significant because they may reinforce stereotypical associations between gender and mathematical applications. When students consistently encounter certain types of mathematical problems associated with particular genders, they may internalize assumptions about which areas of mathematics are more appropriate or interesting for their gender identity.

#### *Science Education:*

Science textbooks show the most dramatic improvement in gender representation compared to historical patterns, yet significant disparities remain. While contemporary texts include substantially more references to women scientists than previous generations of materials, these references often emphasize collaborative contributions rather than independent discoveries. Women scientists are more likely to be presented as part of research teams or as contributors to discoveries led by male scientists.

The treatment of scientific methodology also reveals gendered patterns. Laboratory procedures and experimental designs are often presented using examples that may appeal more to traditionally masculine interests, such as engineering applications or competitive scenarios. While these examples are not explicitly exclusionary, they may contribute to female students' perception that science is not designed for their interests or capabilities.

#### *Language Arts Education:*

Literature curricula continue to be dominated by works authored by men, despite increased attention to including diverse voices. Analysis of reading lists from major curriculum providers indicates that male authors account for approximately 60-65% of required readings, with female authors more likely to be included in supplementary or optional categories.

The treatment of themes and topics within literature curricula also reflects gendered patterns. Works focusing on domestic life, relationships, and emotional development are more likely to be authored by women and to be classified as appropriate for certain types of literary analysis. Works addressing political themes, adventure narratives, and philosophical questions are more likely to be authored by men and to be treated as exemplars of literary achievement.

#### *Social Studies Education:*

History and social studies curricula have made substantial progress in including women's perspectives and contributions, yet the integration of these perspectives often follows an "add women and stir" approach rather than fundamentally reconceptualizing historical narratives. Women's contributions are frequently presented as supplementary to main historical developments rather than as integral to understanding historical processes.

The treatment of political and economic topics continues to reflect masculine-centered perspectives. Political leadership, military conflicts, and economic development are presented primarily through the experiences and perspectives of male historical figures. When women's experiences are included, they are often framed in terms of their relationships to male leaders or their roles in domestic spheres.

### **Implications for Student Development**

Research examining the relationship between biased educational materials and student outcomes reveals significant correlations between exposure to gender-biased content and various measures of academic achievement, career aspirations, and self-concept development. These relationships appear to be particularly pronounced during adolescence, when students are actively developing their sense of identity and future possibilities.

#### *Academic Self-Concept:*

Students who are consistently exposed to educational materials that underrepresent their gender in particular subject areas show lower levels of academic self-efficacy in those areas. This relationship is particularly

pronounced in mathematics and science education, where female students exposed to male-dominated examples and applications report lower confidence in their mathematical and scientific abilities.

#### *Career Aspirations:*

Longitudinal studies tracking student career aspirations reveal significant relationships between the career representations encountered in educational materials and students' later career choices. Students are more likely to aspire to careers that are frequently represented in their educational materials and less likely to consider careers that are absent or marginalized in their educational experience.

#### *Identity Formation:*

The repeated exposure to gendered patterns in educational materials contributes to the formation of gender identity and expectations about appropriate behavior. Students internalize messages about which activities, interests, and career paths are normative for their gender, potentially limiting their exploration of alternatives.

## **Discussion**

### **Theoretical Implications**

The persistence of gender bias in contemporary educational materials, despite decades of reform efforts, suggests that addressing these issues requires more than surface-level changes to content representation. The findings support theoretical perspectives that emphasize the deeply embedded nature of gender bias within educational systems and the need for systematic approaches to promoting equity.

Feminist pedagogical theory's emphasis on the hidden curriculum proves particularly relevant to understanding why numerical improvements in gender representation have not translated into more fundamental changes in how gender is constructed within educational materials. The subtle nature of contemporary bias suggests that reform efforts must address not only what is included in educational materials but how information is presented, organized, and contextualized.

Social learning theory's emphasis on observational learning provides insight into why apparently minor biases in educational materials can have significant effects on student development. The cumulative effect of exposure to gendered patterns across multiple educational contexts and over extended periods creates powerful learning experiences that shape student understanding of gender roles and possibilities.

### **Practical Implications**

The findings have significant implications for educational practice, policy development, and teacher preparation. Addressing gender bias in educational materials requires coordinated efforts across multiple levels of the educational system, from textbook publishing to classroom instruction.

#### *Curriculum Development:*

Educational publishers and curriculum developers need to move beyond numerical representation to examine the qualitative aspects of how gender is portrayed in educational materials. This requires developing more sophisticated analytical frameworks for evaluating gender bias and implementing systematic review processes that can identify subtle forms of bias.

#### *Teacher Preparation:*

Teacher education programs need to provide educators with the knowledge and skills necessary to identify and address gender bias in educational materials. This includes training in critical analysis of educational content, strategies for supplementing biased materials, and techniques for facilitating classroom discussions about gender and representation.

#### *Policy Development:*

Educational policies need to establish clear standards for gender equity in educational materials and provide mechanisms for monitoring compliance with these standards. This includes developing evaluation criteria that address both quantitative and qualitative aspects of gender representation.

### **Limitations and Future Research**

While this analysis provides important insights into the nature and effects of gender bias in educational materials, several limitations should be acknowledged. The focus on textbook content may not fully capture how these materials are used in practice, and the emphasis on published research may not reflect the full diversity of educational contexts and practices.

Future research should examine how teachers and students interpret and use potentially biased educational materials, investigating whether effective pedagogical practices can mitigate the negative effects of biased content. Additionally, research should explore how students from different backgrounds experience and respond to gender bias in educational materials, as the effects may vary based on factors such as socioeconomic status, race, ethnicity, and cultural background.

Longitudinal studies tracking the relationship between early exposure to biased educational materials and later academic and career outcomes would provide valuable evidence about the long-term effects of these biases. Such research could inform the development of more effective interventions and support evidence-based policy decisions.

## Conclusion

This analysis reveals that gender bias in school curricula and textbook representations remains a significant concern for educational equity, despite substantial progress in addressing the most overt forms of stereotyping. While contemporary educational materials demonstrate improved numerical representation of males and females, subtle biases persist in how genders are portrayed, the roles they occupy, and the contexts in which they appear.

The theoretical frameworks examined in this paper provide compelling explanations for why these biases persist and how they influence student development. Feminist pedagogical theory's concept of the hidden curriculum helps explain how implicit messages about gender roles are transmitted through educational materials, while social learning theory illuminates the mechanisms through which students internalize these messages. Critical curriculum studies reveal how educational content reflects and reproduces broader social inequalities.

The empirical evidence reviewed demonstrates clear relationships between exposure to biased educational materials and various measures of student outcomes, including academic self-concept, career aspirations, and identity formation. These findings suggest that addressing gender bias in educational materials is not merely a matter of social justice but also a crucial component of effective education that prepares all students to reach their full potential.

Moving forward, addressing gender bias in educational materials requires sustained effort across multiple levels of the educational system. This includes developing more sophisticated approaches to evaluating and addressing bias in educational content, preparing teachers to identify and respond to biased materials, and implementing policies that support gender equity in education.

The ultimate goal of these efforts should be creating educational environments that provide all students with diverse, inclusive representations that expand rather than limit their understanding of possibilities for their lives and careers. Such environments would not only promote gender equity but would also enhance the educational experience for all students by providing richer, more comprehensive perspectives on human experience and achievement.

Educational materials shape not only what students learn but also how they understand themselves and their place in the world. Ensuring that these materials provide equitable, inclusive representations is therefore essential to the broader project of creating just and effective educational systems that serve all students well.

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