

## Examining Mathematics Teachers' Perception Toward Multicultural Education: Teachers' Noticing of Multicultural Contents in Mathematics Textbooks

Sunghwan Hwang (Elementary School Teacher)<sup>1\*</sup>, Eunhye Cho (Ph.D.  
Candidate)<sup>2</sup>, Lillie R. Albert (Associate Professor)<sup>3</sup>

<sup>1</sup> Seoul Gaju Elementary School, ihwang413@gmail.com

<sup>2</sup> Boston College, eunhye.cho@bc.edu

<sup>3</sup> Boston College, albertli@bc.edu

(Received May 28, 2020; Revised June 16, 2020; Accepted June 16, 2020)

The purpose of this study was to examine mathematics teachers' perceptions of multicultural education. To achieve this goal, the study explored how 10 elementary mathematics teachers noticed multicultural content in a mathematics textbook. Building upon *noticing framework* (Jacobs, Lamb, & Philipp, 2010), we first examined teachers' attention toward multicultural content in a mathematics textbook. Then, we examined teachers' interpretation of the content. We employed a content analysis approach to examine the collected data. The results indicated that most mathematics teachers held a content integration perspective. Their view was that "multicultural education" referred to learning about the diverse cultures of different countries. Moreover, although they noticed some multicultural content in the textbook, they wanted to discuss them in superficially descriptive ways and avoid talking about social justice issues. Additionally, some teachers believed that mathematics is a culture-free subject. They argued that multicultural content should not be presented in mathematics textbooks. We also discussed uncommon themes, which were reported by only a few mathematics teachers.

*Keywords:* teacher noticing, multicultural education, elementary mathematics textbook, textbook content analysis

MESC Classification: D80

MSC2010 Classification: 97D80

### I. INTRODUCTION

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\* Corresponding Author: ihwang413@gmail.com

Until recently, Korea was regarded as one of the most homogeneous countries in the world (Kymlicka, 1995). Beginning in the late 1990s, however, international marriages have been rapidly increasing, and many foreign workers have come to South Korea to find jobs, changing the demographics of an ethnically homogeneous society within a short period (Cho & Park, 2016). Consequently, the multicultural population in South Korea has also been increasing. According to the Korean Educational Statistics Service (2018), about 2.2% (122, 212) of the country's K–12 students are from multicultural backgrounds, which is an increase from the 0.26%, recorded in 2008. Along with the changing multicultural landscape of the population, Koreans have begun to recognize diverse cultural issues in Korean society and hoped to resolve them through multicultural education (Cho & Park, 2016; Kim & So, 2017). Along with these changes, researchers have argued that teachers should have a social justice perspective for the development of equality values in culturally and ethnically diverse societies (Banks & Banks, 2010; Bennett, 2014; Mo, 2009). This is because teachers' perception of multicultural education has an impact on student behavior and perceptions of multicultural issues in society (Gay, 2004; Ladson-Billings, 1995).

Despite the growing attention to the roles of teachers in multicultural education, however, mathematics teachers' perception toward multicultural education has received little attention from educators (Gutiérrez, 2000). Some teachers believe that teaching mathematics is not relevant to multicultural education because the mathematics curriculum is neutral, and the teacher's job is to accurately transfer the curriculum content to their students (Rousseau & Tate, 2003). However, mathematics teachers are not merely transmitters, they are active instructional designers of curriculum materials (Brown, 2009; Lloyd, Cai, & Tarr, 2017; Remillard, 2005). Particular content in curriculum materials is included or excluded in their classrooms, depending on the teachers' perception of them (Remillard, 2005). Therefore, it is critical to understand the mathematics teachers' perception of multicultural education. To achieve this goal, we examined teachers' noticing of multicultural content in mathematics textbooks. Because teachers' perceptions toward multicultural education influences their noticing of multicultural content, examining how teachers focus on some multicultural education elements and filter out others may help researchers understand their perception toward multicultural education (Banks & Banks, 2010; Gutiérrez, 2012; Rubel, 2017; Sleeter, 1997). The following research questions are presented: (a) How do mathematics teachers identify multicultural content in textbooks? and (b) What perceptions do mathematics teachers have on the identified multicultural contents in textbooks?

## II. LITERATURE REVIEW

## 1. MATHEMATICS TEACHERS' NOTICING

Initially, researchers had elaborated on mathematics teacher noticing to describe how teachers attended to particular classroom events while watching a class (Erickson, 2011). For example, Star and Strickland (2008) examined beginner teachers' noticing ability when watching eighth-grade mathematics classroom video clips. They focused on what the teachers noticed about the classroom environment, such as management skills, communication, and mathematical tasks. However, other researchers proposed to extend the narrow concept of teacher noticing to the analysis not only of teachers' attention to a class event but also of how they interpret and react to it (Jacobs, Lamb, & Philipp, 2010; van Es, Tunney, Goldsmith, & Seago, 2014). From a broad perspective, Jacobs et al. (2010) proposed that teacher noticing consisted of a set of skills, including attending, interpreting, and responding. In a study examining mathematics teachers' noticing, for example, the authors asked participating teachers to watch video clips of mathematics lessons and asked to write about what they attended to, how they interpreted what they observed, and what decision they thought the teacher should make.

A teacher's noticing of classroom events is related to their perception of good mathematics teaching (Choy, 2016; Mitchell & Marin, 2015; Schoenfeld, 2011). Based on their beliefs about good mathematics teaching, some teachers may be more likely to notice classroom management skills, while others are concerned with students' conceptual understanding (Erickson, 2011). Therefore, we may understand mathematics teachers' perceptions toward multicultural education by examining what multicultural content they notice or not and how they interpret it. Analyzing mathematics teachers' noticing of textbook content is a relatively new research field. However, some researchers have emphasized the importance of teachers' curricular noticing (Dietiker, Males, Amador, & Earnest, 2018). Because the relationships between teachers and curriculum materials are bidirectional, teachers adapt and transform the curriculum according to what they notice (Remillard, 2005). As such, this study examined how and what teachers noticed when they read mathematics textbooks to examine mathematics teachers' perceptions toward multicultural education.

## 2. THE DOMAIN OF MULTICULTURAL EDUCATION

Multicultural education aims to teach students to respect differences in culture, race, gender, and social class and challenge inequality and discrimination in schools and society (Banks & Banks, 2010). Researchers have suggested different content (what) and

dimension (how) to achieve this goal.

### ***1) Content***

Sleeter and Grant (1991) suggested race, gender, disability, and social class, as elements of multicultural education in that they are strongly connected to inequality issues. Similarly, Banks and Banks (2010) proposed gender, race/ethnicity, social class, religion, and exceptionality (disabilities) as elements to be fairly represented in textbooks. They explained that people's identity is determined not only by their physical characteristics but also on their socially constructed identities. Some mathematics educators have suggested incorporating the mathematics knowledge construction process as an element of multicultural education (Bae, Cho, & Kwon, 2017; Cho, 2018). Because when students learn that mathematical knowledge is not solely developed by a few groups of mathematicians but co-constructed by the various groups of people in different locations and times, they may understand the value of diversity and respect different ideas and perspectives. For example, Bae et al. (2017) claimed that the mathematical contents related to the construction of mathematical knowledge, international mathematicians, and mathematics history should be regarded as elements of multicultural education.

### ***2) Dimension***

Scholars have discussed how multicultural education content is represented in the classroom and differentiated the dimension level in multicultural education approaches (Banks & Banks, 2010; Kim & So, 2017; McCarthy, 1991). McCarthy (1991) proposed three-dimension levels: cultural understanding, cultural competence, and emancipation. The first level, cultural understanding, is comprised of programs to promote students' cultural awareness. The next level, cultural competence, concerns designing programs to develop students' competence in other languages and cultures. The third level, emancipation, goes beyond the boundaries of classroom discourses, asserting that multicultural education should concern about social action to achieve social equity. Similarly, Banks and Banks (2010) conceptualized four dimensions to multicultural education: contributions, additive, transformation, and social action. The contributions approach tends to introduce heroes and holidays of diverse ethnic cultures; the additive approach focuses on introducing various themes and perspectives to students, and the transformation approach advocates changing curriculum to accommodate diverse knowledge construction processes and various ethnic perspectives. The social action approach provides students with opportunities to acquire sufficient knowledge to make decisions regarding important social problems and to take action to solve them. These categorizations might be simply grouped into two-dimension levels: content integration and social justice. The content integration level refers to incorporating examples and

content from diverse cultures in classroom teaching, such as introducing African cultures to students. At this level, the goal of teachers is to promote students' awareness of cultural diversity. The purpose of the social justice level is to increase students' awareness of discrimination in society and enhance their willingness to solve societal problems to make a better society. For example, teachers may explain how racism developed and negatively influenced the interpretation of multicultural students' low mathematics achievement—the low achievement of African American students was influenced by not their lack of mental ability but lack of support from their parents and society.

### 3. RESEARCH ON TEACHERS' MULTICULTURAL PERCEPTIONS

Multicultural education is a form of education that emphasizes cultural diversity and social equality in schooling (Plaut, 2010). Hence, when multicultural content is incorporated into curricula and taught by teachers, students can benefit from learning about the ideas and issues of justice and equity (Banks & Banks, 2010; Gutiérrez, 2000; Sleeter, 1997). Studies have reported that many teachers hold a content integration perspective, assuming that all cultures and people are equal, and their job is introducing that. Hence, the teachers are less likely to attend to issues of prejudice and needs of marginalized groups (Hachfeld et al., 2011). In particular, many mathematics teachers remain reluctant to embrace the social justice perspective because of the traditional ideology that regards mathematics as a universal and culture-free subject (Gutiérrez, 2000; Rousseau & Tate, 2003). As a result, mathematics teachers give little consideration to multicultural-related contents in their teaching (Rousseau & Tate, 2003; Rubel, 2017).

Martin (2009) reported that even when mathematics lessons included contents related to power and social justice, mathematics teachers avoided addressing those topics in class. Similarly, Rubel (2017) found that mathematics teachers only superficially addressed multicultural issues. They believed that their job was merely to introduce diverse cultures and perspectives, not to discuss inequality and prejudice to promote students' sense of social justice. Studies examining Korean mathematics teachers have reported similar findings. Although mathematics textbooks have been revised to include more multicultural content, Korean mathematics teachers do not properly use them in their classrooms (Park, 2011). Because incorporating multicultural education into the general school curriculum is in its initial stage, many teachers do not learn about multicultural education in their teacher education programs (Mo, 2009). Consequently, many teachers do not have sufficient knowledge for teaching multicultural content (Choi & Mo, 2007), and they may not be able to notice multicultural content in mathematics textbooks. Moreover, some teachers viewed

that teaching mathematics is not related to discussing multicultural education (Park, 2011).

### III. RESEARCH METHODS

#### 1. PARTICIPATES AND DATA COLLECTION

Ten Korean elementary school teachers—three males and seven females—voluntarily participated in this study, in which they analyzed the multicultural content of their mathematics textbooks. All of these teachers were participating in mathematics education-related professional development (PD) at the time of the study. Their teaching experience ranged from 1 to 23 years, with an average of 12.6 years. Because participating teachers had experience using the first-semester fifth-grade mathematics textbook for the revised 2009 curriculum (Korean Ministry of Education, 2014), we used it as our target text. To avoid teacher fatigue and diminished commitment to the project (Netemeyer, Bearden, & Sharma, 2003), we asked teachers to analyze half of the first-semester fifth-grade textbook (Units 3 to 6, about 130 pages) using the sample analysis format provided (see Table 1) under self-monitoring conditions. Note that teacher “noticing” included attending, interpreting, and responding, but we only examined the first two parts considering the research purpose; the purpose of this study is examining mathematics teachers’ perception toward multicultural education, but the responding area is more concerned about teachers’ decision in the classroom (e.g., instructional practices). After we had explained the purpose of the analysis in a PD session, participants conducted their analyses individually at locations and times of their own choosing, and they sent scanned copies of their results to us via email. In addition, two authors of this study, who have been dedicated to research on multicultural aspects of mathematics education, analyzed the same textbook for purposes of comparison with the teachers’ analyses.

After receiving the participants’ textbook analyses, we conducted semistructured interviews (Creswell, 2009) via phone calls. The interview data were used to check our interpretations of participants’ content analyses, which helped us understand why some participants focused on certain content, while others did not. The questions focused on the teachers’ curricular noticing, such as, “why do you identify particular elements in the text as multicultural content?” and “how will you adopt them in their mathematics classrooms?” Additionally, we asked questions about unnoticed content, such as “why did you not select the examples of multicultural content?”

Other interview questions about mathematics teachers’ perceptions of multicultural education were developed based on Banks and Banks’ (2010) study, in which they discussed teachers’ perceptions of multicultural education. The main questions were as

follows:

1. How do you define multicultural education?
2. What are the goals of multicultural education?
3. How is multicultural education implemented in your mathematics classroom?
4. What teaching strategies are you using in the mathematics classroom to achieve your goals of multicultural education?
5. What experiences have you had teaching multicultural students?

**Table 1.** Textbook analysis format used by participants

	Attending	Interpreting
Page	Describe multicultural elements in the textbook	How will you adapt the noticed content for your classroom?
⋮	⋮	⋮

## 2. DATA ANALYSIS

This study applied qualitative content analysis (Elo & Kyngäs, 2008) as a methodological approach to examine teachers' curricular noticing. The critical tasks in content analysis are to develop an analytic framework and to code for categories in the data. To customize concepts of general multicultural education discourse for analysis relevant to a mathematics textbook, we synthesized and modified previous scholars' perspectives of multicultural education (Bae et al., 2017; Banks & Banks, 2010; Bennett, 2014; Kim & So, 2017; McCarthy, 1991; Sleeter & Grant, 1991), which led to the development of initial codes. However, after conducting preliminary coding, we decided to eliminate race-, social class-, and disabilities-related codes because the Korean elementary mathematics textbook did not contain such content. Our final analytic codes consisted of two domains: subject and dimension. The subject referred to whether a selected element was related to nationality (A1), gender (A2), or a mathematical element (A3). The dimension was categorized further into content integration (B1) and social justice (B2). The dimension domain focused on teachers' interpretation of attended contents as to how to adapt them. Specific descriptions of individual categories are as follows.

Subject Level (curricular attending)

- Nationality (A1): Groups that share all the characteristics of nations but territory, such as Korean content and culture.
- Gender (A2): Socially and culturally constructed characteristics concerning gender.

- Mathematical element (A3): A concept or content related explicitly to mathematical knowledge and skills, such as mathematical history, mathematicians, and mathematics of other countries.

Dimension Level (curricular interpreting)

- Content integration (B1): Introducing content from different cultures and groups in mathematics textbooks to help students understand cultural diversity.
- Social justice (B2): Increasing students' awareness of discrimination in society and enhancing their willingness to solve societal problems to make a better society.

We first analyzed the textbook for comparison. Then, we coded participants' data. In counting the frequency of references to multicultural content in each participant's written analysis, we excluded repetitions of previously cited cases. For example, there were representations of the father as a cook on several pages, and one teacher selected all of them as multicultural content. In that case, we counted only her first citation as one case and dismissed the others. However, even if a participant identified different multicultural content on the same page, we counted all of them as separate cases. To increase trustworthiness, the first two authors coded and categorized all participants' responses together so that we could negotiate an absolute agreement on the coding (Graneheim & Lundman, 2004). Interview data were also analyzed to enrich our understanding of the participants' analyses and reflections.

## IV. RESULTS AND DISCUSSIONS

### 1. THE AUTHORS' CURRICULAR NOTICING

As teacher-educators and researchers on issues of multicultural education and mathematics education, we first analyzed the same Korean elementary mathematics textbook to determine a baseline of the kinds and frequencies of its multicultural content, which was used to compare the teachers' analyses. Table 2 shows the frequencies and percentages of multicultural content identified in our analysis, which revealed the dominance of nationality (52.9%) and mathematical elements (35.3%), showing a limited gender-related content (11.8%) that concurred with previous studies (Bae et al., 2017). We further analyzed the content in terms of dimension. Because most multicultural content was superficially embedded in the textbook as images to suggest a multicultural environment, they could not be used to promote students' awareness of prejudice and social justice. Only five pieces of content (29.



5%) could be used for teaching social justice.

**Table 2.** Authors' curricular noticing

Curricular attending	Nationality	Gender	Mathematical element
17 (100%) <sup>a</sup>	9 (52.9%)	2 (11.8%)	6 (35.3%)
Curricular interpreting	Content integration	Social justice	
17 (100%)	12 (70.5%)	5 (29.5%)	

*Note.* <sup>a</sup> Total frequencies and percentages

## 2. OVERALL TEACHERS' CURRICULAR NOTICING

The participants' data set from their written analyses comprised 210 cases. After excluding repetitive references, we analyzed 50 cases (see Table 3). Because different teachers provided different numbers of cases, we could not claim that they had similar levels of curricular noticing. However, the overall descriptive analysis revealed that as a group, the teachers most frequently noticed nationality (74%), followed by mathematical elements (22%), and noticed gender-related elements the least (4%), suggesting teachers virtually ignored any gender elements. For curricular interpreting, the majority of teachers responded that they would use the noticed content to introduce other cultures (96%), but only 4% of the teachers' responses were related to prejudice and social justice.

We further analyzed each teacher's data set to understand how they had identified multicultural content. The 10 teachers were labeled from T1 to T10, and their curricular noticing was examined in terms of curricular attending and interpreting. As indicated in Table 4, all teachers but one noticed nationality related content. Moreover, only one teacher (T9) noticed gender-related content. Among the three teachers who attended to mathematical elements, T7 was the only teacher to focus solely on mathematical elements, which excluded other multicultural content. For curricular interpreting, all teachers responded that they would use the noticed content to introduce different cultures and groups. Meanwhile, T9, the only one who noticed gender-related content, claimed she would use it to bring awareness of socially constructed gender roles and dispel related prejudices to her students. Although these findings cannot be generalized to other contexts, the teachers' different noticing does provide evidence of the nature of their curricular noticing of multicultural education in the textbook. In the following, we describe common themes in the teachers' data, followed by a discussion of uncommon but essential themes that warrant consideration.

**Table 3.** Participants' curricular noticing

Curricular attending 50 (100%) <sup>a</sup>	Nationality 37 (74%)	Gender 2 (4%)	Mathematical element 12 (22%)
Curricular interpreting 50 (100%)	Content integration 48 (96%)		Social justice 2 (4%)

*Note.* <sup>a</sup>Total frequencies and percentage

**Table 4.** Each teacher's curricular noticing

		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10
Curricular attending	Nationality	•	•	•	•	•	•		•	•	•
	Gender									•	
	Mathematical element		•	•				•			
Curricular interpreting	Content integration	•	•	•	•	•	•	•	•	•	•
	Social justice									•	

*Note.* The dot indicates that the teacher selected cases related to the category.

### 3. COMMON THEMES

#### ***1) Multicultural Education Refers to Learning About the Diverse Cultures of Different Countries***

Nine of the 10 participants selected nationality cases. They viewed multicultural education as learning about the diverse cultures of different countries. They were much more likely to notice content related to their own and foreign culture (between countries) than gender-based issues. While focusing on cross-cultural differences made them recognize various cultures, it also meant that some teachers implicitly differentiated their own culture from others as a unified entity (Parekh, 2001). For example, T1 stated,

Multicultural education should aim for teaching the world's cultural diversity. Each country has different cultures. Students can become aware of other cultures if they learn about them. Teachers can do this by incorporating some cultural events into their mathematics classrooms.

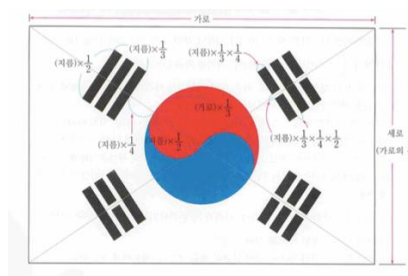
An example, selected by the teacher, portrayed Western food and characters. As illustrated in Figure 1 (left, textbook p. 66), a family is eating pie in a living room. The picture motivated the teacher to think about both foreign and traditional Korean food culture. Another example involved introducing the Korean national flag in a fraction

multiplication problem (Figure 1, right, textbook p. 200), about which T4 said,

I think that the goal of multicultural education is [to teach] students to be aware. Thus, introducing the Korean national flag might help students think about their own country and other countries, including their national flags, resulting in their understanding of diversity.



Unit 3, Reduction of fraction & reduction to a common denominator, p. 66



Unit 6, Fraction multiplication, p. 200

**Figure 1.** Examples of nationality related content

## ***2) Mathematics is a Universal Subject and Mathematical Contents in Textbooks Are Culturally Free***

Another common theme of Korean elementary mathematics teachers' perception was that they were more likely to differentiate mathematical elements from multicultural education. Although they selected some elements as multicultural content, their view was that teaching multicultural education in the mathematics classroom does not make sense. This is because they believed that mathematics is a universal subject. T10 explained that, "Mathematics is a universal subject, in the sense that the mathematical concepts are value-free. If I have to talk about something related to multicultural education in the math classroom, it does not make sense."

Similarly, T5, stressed that social issue-related content, such as race, gender, and nationality, should not be addressed in mathematics classrooms and textbooks. She also argued that because mathematics is a universal subject, teaching mathematics had to be connected with the nature of mathematics, and not with multicultural education.

## ***3) The Teacher's Job is to Introduce Multicultural Content into Lessons, Not Talk About Social Justice***

Many mathematics teachers specifically discussed their adaptation of the noticed contents as a content integration perspective. As noted, content integration refers to

introducing different cultures and groups in textbooks to develop students' understanding of cultural diversity. The teachers stated that they would discuss the contents in the textbook when teaching mathematics to children. However, they were reluctant to use the classroom as a platform to talk about social discrimination and injustice (Rubel, 2017). They assumed that they should not discuss social issues in the mathematics classroom and take over those roles to teachers of social studies (Rousseau & Tate, 2003). T6 explained,

I do not want to talk about social justice in my mathematics classroom. I feel like . . . that is not my job as a mathematics teacher. Maybe I can talk about them in a social studies classroom but not definitely in math class. I want to be a bystander about multicultural issues.

Also, some teachers claimed that discussing social discrimination toward a certain group should be prohibited. T10 said, "You know, all culture is equal, and all people are equally respected. If I address social justice in a lesson, students might realize discrimination and develop a negative attitude toward a particular culture."

#### 4. UNCOMMON THEMES

##### ***1) Mathematics is Developing and Changing; Consequently, Some Content Items in Mathematics Textbooks Are Cultural Products***

Three teachers selected cases related to mathematics history and mathematicians. To increase students' curiosity and encourage additional investigation, the textbook presented a mathematical story at the end of each unit. The teachers selected these contents and pointed out that these cases might help students gain awareness of the idea that mathematics is not static, but it is developing and changing fundamentally toward engagements of various ideas. For example, one teacher (T2) mentioned that the goal of multicultural education in a mathematics classroom was to "understand different mathematical concepts among time and space." Regarding Figure 2 (textbook p. 169), which illustrates traditional Korean measurement and names of geometric shapes, T2 said that "Students could learn different measurement systems, other than the current system, which would promote the idea that mathematical concepts are not given or fixed, but they are cultural knowledge." Other teachers also pointed out that Figure 2 could be used to introduce the measurement systems of other countries, such as the use of inches. These activities might help students respect differences between peoples' culture.



Unit 5, Area of a polygon, p. 169

**Figure 2.** An example of mathematics mathematical elements related content

One teacher (T7) only focused on mathematical content, arguing that the goal of multicultural education in mathematics is to develop a variety of reasoning and problem-solving skills and to understand the mathematical knowledge construction process. The teacher said, “Students should learn mathematics through various problem-solving strategies that help students understand the different mathematical ideas of various people. Such an approach might be related to multiculturalism in mathematics education.” As an example, she described a mathematics problem where students were asked to draw triangles that have the same area but are different shapes (see Figure 3), with the notion that students could learn about multiculturalism by seeing how their peers had different ideas about this task.

2 모눈종이에 넓이가  $8\text{ cm}^2$ 인 서로 다른 모양의 삼각형을 여러 개 그려 보시오.



Unit 6, Area of a polygon, p. 151

**Translation**

Draw various shapes of triangles with an area of  $8\text{ cm}^2$

**Figure 3.** An example selected by a mathematics-focused teacher

**2) The Goal of Multicultural Education is to Promote Social Justice**

The teacher (T9) who represented the social justice perspective selected both cultural

relativism between countries cases and equity cases within a country. She underlined multicultural education as an approach to promote knowledge and values to support social justice and achieve social equity (Banks & Banks, 2010). She also asserted that the goal of multicultural education was to “cultivate values and social skills needed for achieving social justice beyond simply understanding of various cultures.” This perspective was different from other teachers, focused on the awareness of differences among cultures, not issues within a culture.

By comparing a father in an apron (Figure 4, left, textbook p. 100) and a female student playing the piano (Figure 4, right, textbook p. 124), for example, the teacher argued that the illustration might reinforce students’ biased perceptions of gender roles, that females are good at art and music and wear pink sweaters, while males are good at sports and mathematics and wear blue sweaters. However, the first illustration could help students to challenge traditional gender role expectations. It is important to note that while the textbook included gender-related content across several pages, not any of the other teachers attended to this content as multicultural cases.



Unit 4, fraction addition & subtraction, p. 100 & p. 123

**Figure 4.** Examples of gender-related content

## V. CONCLUSIONS

In the context of the increasingly multicultural school population, this study examined mathematics teachers’ perceptions toward multicultural education. To achieve this goal, this study examined 10 Korean elementary mathematics teachers’ noticing of multicultural content in the textbook. This study both confirms and extends previous literature regarding

teachers' lack of awareness regarding multicultural education (Castro, 2010; Choi & Mo, 2007; Martin, 2009; Rubel, 2017). The findings demonstrated that while the textbook did not explicitly prescribe the multicultural content teachers should be teaching to their students, teachers perceived these cases differently because, based on their perceptions and knowledge of multicultural education, educational resources vary (Castro, 2010; Rubel, 2017; Sleeter, 2008). Most participants only focused on nationality cases and talked about content integration as a teaching strategy. They believed multiculturalism is similar to introducing the culture of another nation, and some teachers stressed that social issue-related content, such as gender, should not be addressed in mathematics classrooms. In terms of the relationship between mathematics and multicultural education, many teachers differentiate mathematical teaching from multicultural education because they believed that multicultural beliefs are not necessary for teaching mathematics, and mathematics content in textbooks are cultural-free. Only one teacher who noticed gender-related content emphasized the importance of recognizing the prejudice and discrimination that members of society had developed over time. This perspective indicates that Korean elementary mathematics teachers are inclined to frame multicultural education as a pedagogy introducing cultures of diverse countries while neglecting social equality issues (Rubel, 2017; Song, 2006).

Teachers' narrow perception toward multicultural education evidently influences students' learning and understanding of multicultural issues in society. Considering mathematics teachers' active roles in curriculum interpretation and implementation (Sherin & Drake, 2009), researchers and educators should be concerned about teachers' noticing of multicultural content. When teachers ignore multicultural contents in the textbook, their students are also likely to ignore these issues and may believe that multiculturalism only involves learning about other countries' cultures as static information in certain subjects, such as social studies; the students tend to believe that multicultural education is only related to a certain subject, not mathematics (Rousseau & Tate, 2003). By revealing the generally superficial nature of these mathematics teachers' concepts of multicultural education, this study emphasizes the necessity of changing Korean elementary mathematics teachers' perceptions of multicultural education, to include issues within society and enhancing their curricular noticing of multicultural content.

In this regard, this study also highlights the need for further research on ways to enhance teachers' curricular noticing of multicultural content in the textbook. Given that teachers' curricular noticing is influenced by their beliefs and knowledge (Choy, 2016; Mitchell & Marin, 2015), future studies should investigate the impact of PD on teachers' curricular noticing and identify effective practices for resolving the gap between changing social environments and mathematics teachers' multicultural blindness (Rubel, 2017). Further

research into mathematics teachers' instructional practices, and their relation to their curricular noticing, may provide insight into how their interpretations of the curricular material constrain or support instruction that raises their students' awareness of issues of equity and social justice. The goal of multicultural education is not merely for teachers to increase their awareness of multicultural content, but for them to incorporate those elements into their teaching (Banks & Banks, 2010). Therefore, analyzing how teachers use the content in their mathematics instruction is an essential step toward achieving the goal of multicultural education.

The curricular noticing framework and content analysis approach adopted in this study may be helpful in future studies of teachers' perceptions of multicultural content in textbooks. Moreover, teacher-educators should provide additional programs for developing their curricular noticing and the productive ways of using them in their teaching. Teachers themselves must actively attend to multicultural content and use it in their classrooms to support the goal of enhancing social justice through multicultural education.

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