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The Use of Middle School Atlases in the Social Studies Classroom in South Korea

Abstract

Middle school atlases are supplementary textbooks for social studies learning in South Korea. Although atlases are developed and designed to provide various useful resources for students' social studies learning, especially geography, atlases have not been frequently used in actual social studies classrooms, and sometimes they are never used. This study reports the causes of low adoption rates of middle school atlases in Korean social studies classrooms through the analysis of survey responses from both teachers and students. This study also addresses ways of increasing the use of atlases in the classroom.

Keywords

Geography education, Middle school, Atlases, South Korea

1. INTRODUCTION

As geographic representation and communication tools, maps are important in learning geography and related subject areas (Bednarz et al. 2006; Niedomysl et al. 2013). Students can develop geographic and spatial thinking skills by identifying, interpreting, and analyzing spatial information, such as spatial distribution, relationships, and patterns on a map (Bednarz et al. 2006; Koç and Demir 2014; Weeden 1997). Therefore, as a collection of maps, atlases have been useful and effective instructional resources particularly for geography education (Keller et al. 1995; Klein 2003; Wiegand 2003). Atlases allow students to learn and understand various physical, environmental, historical, and social topics in the local area or in the world (Battersby et al. 2011; Thomas et al. 1999). Compared with regular atlases for public use, maps in educational atlases should be designed based on students' map-reading skills and follow planned learning objectives (Koç and Demir 2014; Lee and Jung 2009; Wiegand 2003). These educational atlases need to be considered as significant materials alongside main textbooks rather than auxiliary materials in class (Harris 1977).

The South Korean government has acknowledged the usefulness and effectiveness of atlases as educational resources for a long time. Thus, since 1955, the Korean national curriculum has included atlases as supplementary textbooks for social studies learning (Lee and Jung 2009). Due to space limitations in main social studies textbooks, middle school atlases have been developed to provide not only maps, but also various visual aid resources, such as maps, charts, photos, and illustrations (Lee and Kim 2000; Shin and Park 2003). Although atlases have been designed to improve students' social studies learning, they have not been effectively implemented in class (Jeong and Shin 2007; Kang 2006; Shin and Park 2003). According to Kang (2005), the use of atlases in class has been limited to a location reference; students have simply used atlases to find and confirm a certain location on maps. Additionally, students have negative perspectives of atlases because they are expensive, heavy, and large compared with other textbooks, so students tend to bring atlases to class reluctantly (Shin and Park 2003). Therefore, low classroom use of atlases has been an ongoing issue.

For the effective, practical use of atlases in class, several researchers have conducted studies primarily focusing on the analysis of the content and organization of atlases, atlases' associations with main social studies textbooks, appropriateness for middle school students, and the status of atlas use by a group of teachers or students (Kang 2006; Lee and Kim 2000; Shin and Park 2003). However, few studies have investigated reasons for the limited use of atlases in class based on both teachers' and students' perspectives and opinions on atlases. The goal of this study is to identify the causes of low adoption rates of middle school atlases by analyzing survey responses from both teachers and students, which included questions regarding the actual classroom use of middle school atlases, teachers' and students' evaluations and perceptions of atlases, and suggestions for the improvement of atlases. Based on their responses, the authors propose ways of increasing the use of atlases in the classroom. The results of this study may be valuable for designing and developing useful and effective atlases for Korean middle school social studies classes. However, they may also be beneficial for geography and social studies classes in other countries by providing helpful atlases for teaching and learning as

important instructional materials. The following are the research questions that direct this study:

- How are middle school atlases used in the classroom?
- How do teachers and students assess middle school atlases?
- What are ways of improving middle school atlases to be used in class more often?

2. BACKGROUND

The Korean Ministry of Education and Human Resources Development has developed the standardized national social studies curriculum to educate and foster individuals to be able to understand social phenomena, systems, and functions and participate as members of society (National Curriculum Information Center 2015). The current national curriculum has been in effect since 2009. The middle school social studies curriculum is composed of geography, history, and other social sciences. Geography and social sciences are combined as one subject called social studies, which is taught in the 7th and 9th grades. The course titles are Social Studies I for the 7th grade and Social Studies II for the 9th grade. Each course has almost equal amounts of geography and other social sciences content. In geography, students learn about regional (i.e., physical and cultural differences in each region) and systematic geography (theme-based, i.e., physical geography, environmental studies, economic geography, cultural geography, political geography, and population geography). The social sciences section contains political science, economics, civics, and sociology content. Meanwhile, the history content covering Korean history and world history is structured as a stand-alone subject called history, which is taught in the 8th grade.

Under the previous national curriculum (e.g., 6th: 1992 to 1996 and 7th: 1997 to 2006), the middle school social studies curriculum included geography, history, and social sciences, so at that time, middle school atlases provided resources for both geography and history content (National Curriculum Information Center 2015). However, under the current national curriculum, two types of atlases are available for middle school students: Social studies atlases and history atlases. The social studies atlases are designed to help students learn geography content in social studies, and the history atlases provide maps and other visual aid resources for the learning of Korean history and world history (Korea Institute for Curriculum and Evaluation 2011; National Curriculum Information Center 2015). Therefore, any history-related maps and other resources (e.g., territorial expansion and changes of the post-division of Korea) are only available in the history atlases. This study did not consider history atlases and only focused on the use of social studies atlases in class. In this paper, middle school atlases refer to social studies atlases.

Currently, eight private publishers publish middle school atlases based on the national curriculum framework with the Ministry of Education, Science, and Technology's (MEST) authorization (National Curriculum Information Center 2015). Like any other textbook, schools can choose their preferred atlas, so it is possible for schools to choose the same or different publishers for a social studies textbook and an atlas (Moon and Koo 2011). The 7th and 9th-grade social studies courses are expected to use atlases, and every student is required to purchase an atlas when they enter middle school (Shin and Park

2003). However, the use of atlases is not mandatory in the classroom. Instead, social studies teachers can use them freely, so depending on the teachers, atlases are used frequently or not used in class at all. The possibility of using the resources in the atlases for testing also depends on the teachers. Some teachers may use maps in main social studies textbooks for tests without using resources in atlases.

According to Lee and Kim (2000), middle school atlases perform six functions: (1) Increasing learners' interest and motivation for learning, (2) providing basic learning content for social phenomena, (3) motivating an analytical process for social phenomena, (4) providing resources for the social studies subject, (5) suggesting sequences of teaching and learning, and (6) providing questions for exercises and assignments. Since atlases' main function is providing resources for the social studies subject, various types of resources are available in atlases. Middle school atlases consist of the main content, workbooks, and appendices. The main content contains general reference maps, thematic maps, illustrations, charts, and photos. General reference maps are used to represent regions of South Korea and different continents. Thematic maps, photos, charts, and illustrations are used to provide useful and supplementary information for each unit of geography content so that students understand corresponding content better. Workbooks are designed to enhance students' geographic thinking, critical thinking, and problem-solving skills through analyzing information and answering the given questions in workbooks. Appendices contain statistics, an index, and outline maps. Among the eight atlases, only one provides outline maps. Outline maps are empty maps with minimal physical information, such as boundaries, rivers, and lakes, and they are designed for classroom use.

Previously, researchers identified two major issues of middle school atlases: (1) The unbalanced organization of resources in atlases and (2) their inappropriate level of difficulty for middle school students. Resources in atlases published under the 6th and 7th national curriculum leaned too much towards certain content units and areas. Although every content unit had a certain number of supportive resources in the atlases, they had not been evenly distributed (Lee and Kim 2000). There were more resources related to natural environment and natural resources/industries units but fewer resources for environmental pollution and natural disasters. In addition, due to political and geographical influences, the numbers of related resources for regions or countries were different (Shin and Park 2003). In South Korea, the central region (including the capital, Seoul) and the southern region (including the second largest city, Busan) had more related resources than other regions. Globally, nations allied with South Korea (e.g., the United States) and geographically closed Asian countries (e.g., China and Japan) had relatively high numbers of resources compared with other countries. A balanced organization of resources is necessary for providing diverse, unbiased information and knowledge for students.

Moreover, difficult-to-understand maps for middle school students have been identified as a serious issue. According to Lee and Kim (2000), several maps in atlases had too many symbols or classes, so the majority of students had a hard time reading and understanding those maps. Kang (2006) also pointed out that students had low levels of thematic map-reading skills, but several thematic maps were made without consideration of students' ability to comprehend. Particularly, students reported high numbers of

symbols on a relatively small-sized thematic map was the most complex and difficult type. Additionally, thematic maps in atlases often ignored cartographical principles because unprofessional cartographers designed maps or changed the colors on maps published by other countries (Jung and Hwang 2006). Thus, some thematic maps covered too many variables or combined both qualitative and quantitative data without using proper symbolization. There were also too many small maps with different scales on single pages of atlases.

The current atlases still have similar issues to those of previous versions. The authors found unbalanced proportions of resources in three current atlases. For example, on average, sixteen thematic maps are available for two units—"Natural disasters and human life" and "Global economy and regional changes"—but there are only three to four thematic maps related to "The world where I live unit." The authors were also able to see somewhat complex and difficult-to-read and understand maps for students. Since atlases are designed and developed following governmental guidelines like any other textbook in South Korea, there is less flexibility regarding reorganizing and redesigning them for learners (Kang 2006).

3. METHODS

To examine teachers' and students' assessment and perspectives on middle school atlases, a total of seventeen middle school social studies teachers and 903 students in Seoul and Siheung, Gyeonggi Province, were invited to participate in surveys on September 1 to September 14, 2014. With a population of approximately 10 million, Seoul is the capital of South Korea and located at the center of Gyeonggi Province, which is the most populous province in South Korea (Korean Statistical Information Service 2010). Siheung is "a marine industrial city" located in the southwest of Gyeonggi Province, and about 400,000 people reside in the city (Korean Statistical Information Service 2010; Siheung City 2013). The Korean Ministry of Education evaluates the academic achievement level of Korean language, mathematics, and English for all 9th and the 11th-grade students every year. According to the results from 2014, the 9th-grade students in Seoul had a higher percentage of above-average students in mathematics (4.5%) and English (2.3%) than Gyeonggi but had a lower percentage for Korean language (1.1%) (Ministry of Education 2014). These two areas follow the national curriculum, so students in both areas learn the same social studies content.

The authors developed two separate survey questions for teachers and students. A questionnaire for teachers was developed using Google Form, and its link was sent to nineteen teachers who worked in middle schools in Siheung or who enrolled in the Graduate school of Education at Korea University. Among the nineteen invited teachers, seventeen teachers in Seoul and several cities in Gyeonggi Province completed the survey. As shown in Table 1, the participating teachers comprised four males and thirteen females, and all teachers taught 7th and/or 9th-grade social studies. They were aged from 20 to 40, and their years of teaching experience were from 0–5 years to 15–20 years. Their educational background was geography or social sciences, but they all had a certificate to teach middle school social studies.

Table 1. Description of participating teachers.

Teaching Grade	Gender	Age	Years of Teaching Experience	College Major
7	Female	20-29	0-5	Geography
7	Male	30-39	5-10	Geography
7	Female	30-39	5-10	Social sciences
7	Female	30-39	5-10	Social sciences
7	Female	30-39	5-10	Geography
7	Female	30-39	5-10	Geography
7	Female	30-39	5-10	Social sciences
7	Female	30-39	5-10	Geography
7	Female	30-39	10-15	Social sciences
7	Female	40-49	15-20	Social sciences
9	Male	30-39	10-15	Geography
9	Female	30-39	10-15	Geography
7 and 9	Male	20-29	0-5	Social sciences
7 and 9	Female	20-29	0-5	Social sciences
7 and 9	Female	30-39	5-10	Geography
7 and 9	Female	30-39	5-10	Social sciences
7, 8, and 9	Male	40-49	5-10	Geography

For students, a paper-based survey was developed and distributed to students in three middle schools (one of the author's schools and two participating teachers' schools). A total of 265 7th-grade students at middle school A in Seoul, 178 7th-grade and 201 9th-grade students at middle school B in Siheung, and 259 9th-grade students at middle school C in Siheung participated in this study. Therefore, 59.8% of the 7th-grade students were from Seoul, and 40.2% were from Siheung. All 9th-grade students were from Siheung. These participating students completed the survey during regular social studies classes. Since a middle school atlas is a supplementary textbook for geography content in social studies, the authors only recruited the 7th and 9th-grade students who were studying geography content. The 8th-grade students were not invited because they were studying Korean history and world history.

In the case of students, nearly equal amounts of male and female students (50.4% and 49.6%, respectively) participated in this study (Table 2). In terms of grade level, there were 443 (49.1%) 7th-grade and 460 (50.9%) 9th-grade students. Students were asked to assess their own overall academic and social studies achievement levels to obtain students' basic academic information and to compare their responses based on the achievement levels. The ratios of high, medium, and low for overall academic and social studies achievement levels were similar. Approximately, 20% of the students self-assessed themselves as either high or low, and the remaining students marked them as medium for both.

Two separate survey questionnaires for teachers and students included open-ended, multiple-choice, and Likert-scale questions to analyze their different perceptions and views regarding using a middle school atlas for teaching and learning in social studies (Tables 3 and 4). Common question categories for both questionnaires were the use of an atlas in class, resources in an atlas, satisfaction level, and suggestions for improvement.

Additional questions were included in each questionnaire separately, such as teachers' perceptions of an atlas' usefulness for learning and students' use of an atlas outside of class. There were several reasons for asking these questions. The authors wanted to know:

- How teachers and students actually used atlases in the classroom and any barriers that limited the classroom use of atlases,
- What types of resources in atlases needed to be added or deleted in the next updated versions of atlases,
- How teachers and students evaluated the usefulness of atlases for teaching and learning,
- How teachers and students liked the current atlases,
- How to design more satisfactory atlases, and
- What types of modifications and improvements needed for future atlases.

Table 2. Description of participating students.

		7th Grade (n=443)	9th Grade (n=460)	Total (n=903)
Male		233 (52.6%)	222(48.3%)	455 (50.4%)
Female		210 (47.4%)	238 (51.7%)	448 (49.6%)
Academic achievement level	High	87 (19.6%)	96 (20.9%)	183 (20.3%)
	Medium	288 (65.0%)	273 (59.3%)	561 (62.1%)
	Low	68 (15.3%)	91 (19.8%)	159 (17.6%)
Social studies achievement level	High	126 (28.4%)	78 (17.0%)	204 (22.6%)
	Medium	236 (53.3%)	259 (56.3%)	495 (54.8%)
	Low	81 (18.3%)	123 (26.7%)	204 (22.6%)

Table 3. Sample survey questions of the teacher survey.

Categories	Questions
Use of atlases in the classroom	How often do you use atlases?
	Which topics do you frequently use atlases for?
	What are the reasons not to use atlases?
Resources in atlases	Which resource in atlases do you use most?
	Which resource in atlases is the most necessary?
	Which resource in atlases is less necessary?
	Among the currently available resources in atlases, which one would you like to see more of?
	What types of additional resources would you like to have, except currently available resources in atlases?
Usefulness	Is a middle school atlas a necessary textbook?
	Are lessons with atlases helpful for students' learning? If so, how?
	Except for learning, are there other positive effects of the use of atlases for students?
Satisfaction level	Are you satisfied with atlases? If not, why?
Suggestions for improvement	Can you suggest ways of improving atlases to be a useful textbook?

Table 4. Sample survey questions of the student survey.

Categories	Questions
Personal background	Do you like the social studies class?
	Are you used to searching for place names or regions you do not know in your daily life? If so, how do you search for them?
	Do you have atlases?
	Can you find a region or specific information you would like to know in atlases by yourself?
Use of atlases in the social studies classroom	Do you have atlases?
	Do you often use atlases in the classroom?
	Are atlases helpful for learning social studies? If so, in what respect?
Use of atlases outside of the classroom	Have you used atlases outside of the social studies classroom?
	Besides in class, do you use atlases personally?
Resources in atlases	Which resource in atlases interests you the most?
	Can you understand given resources in atlases alone?
Satisfaction level	Are you satisfied with atlases? If not, why?
Suggestions for improvement	What aspects of atlases do you want to improve?

4. RESULTS AND DISCUSSION

4.1 HOW ARE MIDDLE SCHOOL ATLASES USED IN THE CLASSROOM?

Few teachers frequently used atlases in their classrooms. Of seventeen teachers, only one teacher used an atlas every class. Other teachers used them 1–2 times per week (5), 1–2 times per month (6), and 1–2 times per semester (3). Surprisingly, two teachers reported that they never used them in class. The reasons identified for not often using atlases in the classroom were the following: It was more convenient to use digital and multimedia resources than atlases; there was no time to catch up with planned course progress, and a lack of useful resources on atlases for classroom use.

Between teachers who majored in geography and social sciences at college, geography major teachers used atlases more frequently than social sciences major teachers. The teacher who used atlases every class and four teachers who used them 1–2 times per week were all geography majors. However, two teachers who never used atlases were both social sciences majors. Geography major teachers are academically trained to learn about maps and their importance and usefulness for understanding geographic information. Therefore, they are familiar with teaching with atlases. However, social sciences major teachers are not used to learning with maps, so atlases are not familiar tools for them. This may result in their less frequent use of atlases when they teach.

The small number of students who brought atlases to class was also one reason that made teachers avoid using atlases. Although all students are required to purchase atlases when they start the 7th grade, only 73.6% of the participating students reported that they had atlases when the survey was taken. In terms of grade level, 88.9% of the 7th-grade students had atlases, while only 58.9% of the 9th-grade students had them. Those

students who did not have atlases happened to have lost them or thrown them away because they were not used, or students did not know that atlases were intended to be used for the 9th grade. Based on students' experience of the rare use of atlases in 7th grade, they may have assumed that atlases would not be used for the 9th grade either. Alternately, this may have occurred because the 7th-grade social studies teachers did not correctly inform students of the role of atlases, which provide resources for both 7th and 9th-grade content.

Those teachers who used atlases in class typically used them for the regional geography units, such as "The suitability of regions for human habitation," "Lifestyles in regions with extreme climate conditions", and "Travel to nature." Among the systematic geography units, teachers used atlases for "The world where I live" unit mostly and not much for other units. The mentioned four units are the first four units of geography content in the 7th grade. The results show that teachers used atlases mostly for 7th-grade geography content and not much for the 9th grade. Although the amount of resources related to each unit was not evenly distributed, there were related maps, charts, and photos for all units. It is important to encourage teachers to use atlases throughout the entire geography content.

As expected, students' responses on the use of atlases were somewhat similar to those of teachers (Table 5). Less than 10% of the students agreed or strongly agreed that they used atlases in social studies class; its average score was below "disagree" (1.9). The 9th-grade students' responses on atlas use in class (1.5) were more negative than those of the 7th-grade students (2.4). The results clearly show that the 9th-grade social studies classes were less likely to use atlases. Except social studies, other subjects barely used atlases. Only 10.1% of the students reported that they used atlases for history, science, or mathematics. In addition, students rarely used atlases outside of class. Only a few students used them personally to find certain location information. Similar to the results of the previous study (Kang 2005), most students used atlases in class passively rather than actively and voluntarily for obtaining or searching for information.

Table 5. Students' usage of middle school atlases using a five-level Likert-scale (n=903: 443 (7th) + 460 (9th)).

		Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)	Avg.	95% Confidence Interval
Use in the social studies classroom	7th	120 (27.1%)	126 (28.4%)	125 (28.2%)	63 (14.2%)	9 (2.0%)	2.4	2.3 to 2.4
	9th	251 (54.6%)	173 (37.6%)	33 (7.2%)	2 (0.4%)	1 (0.2%)	1.5	1.5 to 1.6
	Total	371 (41.1%)	299 (33.1%)	158 (17.5%)	65 (7.2%)	10 (1.1%)	1.9	1.9 to 2.0

4.2 HOW DO TEACHERS AND STUDENTS ASSESS MIDDLE SCHOOL ATLASES?

Overall, not all teachers were satisfied with the content of middle school atlases, but large numbers of teachers assessed them as necessary and useful resources for students. As shown in Table 6, less than half of teachers (two teachers strongly agreed and six teachers agreed) answered positively regarding satisfaction with the content of middle school atlases (3.5). Nine teachers were not satisfied because some resources were outdated, and some maps were too complex and difficult for middle school students. Those teachers also pointed out issues with relationships between middle school atlases and social studies textbooks' publishers. If they were from the same publisher, there could be a considerable amount of duplicated resources. However, eleven teachers agreed or strongly agreed that atlases were necessary instructional materials for students because they help develop students' map reading skills; increase their interest in maps, locations, and regions; and improve their sense of space (3.7). In addition, the majority of teachers (13) believed that middle school atlases were helpful for students' learning in social studies (3.9).

Table 6. Teachers' assessment of middle school atlases using a five-level Likert-scale (n=17).

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)	Avg.	95% Confidence Interval
Satisfaction	0	2	7	6	2	3.5	3.0 to 3.9
Necessity	1	1	4	7	4	3.7	3.1 to 4.3
Helpfulness for students' social studies learning	0	2	2	9	4	3.9	3.4 to 4.4

In contrast, students' assessment of middle school atlases was different from the teachers' results. As Table 7 shows, students' satisfaction with middle school atlases was in between "disagree" and "neither agree nor disagree" (2.8). Between the 7th and 9th grade students, the 9th-grade students' satisfaction level (2.5) was lower than that of the 7th-grade students (3.1). The most frequently identified reason of dissatisfaction with middle school atlases was related to their actual usage in the classroom (43.2%). Because they were rarely used in the classroom, students were not satisfied with their existence as textbooks. Students also frequently mentioned that it was inconvenient to bring them additionally (27.2%); they were too big and heavy (27.0%); and they were just not interesting (25.7%). Some students also mentioned that the main social studies textbooks were sufficient for social studies learning (18.7%).

Regarding the question on helpfulness for learning social studies, students' responses were more negative than the satisfaction level (2.6). Similar to the results of satisfaction, the 9th-grade students' responses were more negative than those of the 7th-grade students. More than half of the 9th-grade students did not agree that atlases were helpful for learning in social studies. However, those students who answered positively believed that atlases were helpful for understanding social studies lessons because they provided location information (28.3%) and resources about regions and countries that students did not know well (25.8%). Students also mentioned that they could study more detailed

content using atlases than social studies textbooks (7.3%) and develop data analysis skills through practice with charts and maps in atlases (7.3%).

Table 7. Students' assessment of middle school atlases using a five-level Likert-scale (n=903: 443 (7th) + 460 (9th)).

		Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)	Avg.	95% Confidence Interval
Satisfaction	7th	48 (10.8%)	52 (11.7%)	198 (44.7%)	95 (21.4%)	50 (11.3%)	3.1	3.1 to 3.2
	9th	89 (19.3%)	86 (18.7%)	244 (53.0%)	34 (7.4%)	7 (1.5%)	2.5	2.5 to 2.6
	Total	137 (15.2%)	138 (15.3%)	442 (48.9%)	129 (14.3%)	57 (6.3%)	2.8	2.7 to 2.9
Helpfulness for learning social studies	7th	76 (17.2%)	62 (14.0%)	155 (35.0%)	108 (24.4%)	42 (9.5%)	3.0	2.9 to 3.0
	9th	137 (29.8%)	123 (26.7%)	160 (34.8%)	37 (8.0%)	3 (0.7%)	2.2	2.2 to 2.3
	Total	213 (23.6%)	185 (20.5%)	315 (34.9%)	145 (16.1%)	45 (5.0%)	2.6	2.5 to 2.7

More negative responses from the 9th-grade students for any questions are perhaps natural results. Previously, several researchers have shown that as students get older, their negative attitudes toward school increases, and middle school students in particular show these changes of behavioral patterns clearly (Anderman and Maehr 1994; Epstein and McPartland 1976; Marsh 1989). The 7th grade is the starting year in middle schools, so students show positive attitudes to school in general; they are interested in the new school system, coursework, teachers, and friends. Another possible assumption is 7th-grade students' lack of time to evaluate the usefulness and effectiveness of atlases for their learning because they had used atlases for approximately one semester only. However, 9th-grade students tend to be more critical and negative toward school than previous years. From their personal experience of the rare use of atlases, they could have developed negative perspectives of atlases.

Participating teachers and students also evaluated various resources in atlases, including maps (general reference, thematic, and outline maps), photos, charts, statistics, workbooks, and explanation for maps. Among them, teachers agreed that all three types of maps were necessary in atlases, and photos and charts were also useful. Although not all atlases provided outline maps, teachers considered them useful resources. Outline maps allowed students to be active learners by not only enabling them to understand geographic information, but also organizing and representing geographic information. However, workbooks and explanations for maps were less useful for teachers.

On the other hand, students pointed out that general reference maps (46.0%) and photos (35.9%) were interesting resources for them. In contrast to the teachers' responses, only small numbers of students were interested in thematic maps (5.1%) and charts

(4.7%). The results indicate that students were interested in easy-to-understand resources. Students liked to use atlases to obtain location information from general reference maps because identifying location information was relatively easier for middle school students than understanding and analyzing the spatial distribution and patterns of the geographic representation of a certain topic. In addition, students could understand photos easily because most photos on atlases delivered information directly without the need for in-depth analysis. Therefore, students were more interested in photos than thematic maps and charts, which required analytical thinking. To increase students' interest in atlases, it is important to provide appropriate levels of resources and introduce resources gradually based on their levels, from simple and straightforward to difficult and complex resources.

4.3 WHAT ARE WAYS OF IMPROVING MIDDLE SCHOOL ATLASES TO BE USED IN CLASS MORE OFTEN?

To be necessary textbooks for social studies courses, teachers recommended that atlases need to provide multimedia resources in a DVD format. These multimedia resources may increase students' interest and allow teachers to show them in the classroom easily. Some teachers would like to see up-to-date resources to explain the most recent trends and patterns. Since the content of atlases does not change annually, the dearth of recent resources is problematic in this fast-changing world. Other teachers wanted to have easy-to-understand maps for students because some maps were too difficult for middle school students without a teacher's explanation. As suggested by other studies, the ease of understanding maps for middle school students would be increased by maps with small numbers of symbols or classes, maps that do not represent multiple themes together, and small scale-maps in a large size (Jung and Hwang 2006; Kang 2005; Lee and Kim 2000). Additionally, teachers desired to see easy-to-follow organization and attractive design (e.g., not providing too many resources on one page and using interesting illustrations to increase students' interest and motivation). They also wished to have more photos, thematic maps, and charts in atlases. Teachers would like to see more workbooks in atlases, although they agreed that workbooks were less useful than other types of resources in atlases as described above.

Unlike teachers who recommended mainly content for atlases, students' recommendations leaned too much towards the format and physical appearance of atlases. Students would like for atlases to have interesting organization (45.6%), to be combined with social studies textbooks (39.8%), and have reduced size (37.0%). Currently, each publisher is free to choose the size of their atlases, so their sizes vary, from approximately A4 (8.27 in × 11.7 in) to B4 (9.84 in × 13.9 in), and they are relatively larger and heavier than other textbooks. Since teachers usually keep their atlases on their desks, they do not feel uncomfortable about atlases' large sizes and heavy weight. Instead, teachers prefer large atlases for high legibility. However, students are dissatisfied with the sizes and weight of atlases because some atlases do not fit in students' desk drawers and lockers, and they often need to bring atlases to schools. It may be better to reduce their sizes slightly while maintaining legibility so that students can store or bring them easily.

Additionally, regarding content, students wished to have more easy-to-understand maps (17.6%), up-to-date and reliable information (17.3%), and detailed maps for each region (8.7%). Yet again, maps with appropriate levels for middle school students are significant. Atlas publishers should consider designing maps with simple symbols, simplifying and generalizing patterns, and not including too many themes in one map. Several cartographic generalization methods (e.g., simplification, reclassification, aggregation, and exaggeration) would be helpful to design proper maps for middle school students. There were also students who needed more help with using atlases by having additional time to learn how to use atlases and how to read maps (10.7%) and additional explanations for maps (10.3%). Atlases briefly provide information about map symbols and methods for searching for a location on maps. However, such brief information is not enough for all students. A total of 27.2% of the students reported that they could not find a region or certain information in atlases, and 43.4% of the students could not understand maps and charts in atlases alone. Teachers also mentioned that they could not teach students how to use atlases and read maps in detail because of limited class time and infrequent use of atlases in class. A lack of instruction for atlases and maps in general needs to be addressed to increase the use of atlases in class.

5. CONCLUSION

In South Korea, middle school atlases have been developed and designed for helping students' social studies learning, but the actual use of atlases in social studies class has not met expectations. In this study, the authors conducted surveys with social studies teachers and students to identify reasons for the limited use of middle school atlases in Korean social studies classrooms. In reality, teachers' use of atlases varied, from using them in every class to not at all. Those teachers who did not use atlases frequently stated that other multimedia and digital resources were more convenient and useful than atlases, and atlases were sometimes not accessible because not all students brought them to class. Meanwhile, students did not feel the need for atlases because atlases were rarely used in class, so some students lost them or threw them away. Even if students kept their atlases, it was inconvenient for them to bring atlases to school because they were large and heavy. As a result, teachers' infrequent classroom use of atlases and students' negative perspectives and opinions on atlases were closely related to each other. Thus, it is important to think about ways of increasing the use of atlases in class by addressing both groups' opinions. Based on both teachers' and students' responses, we propose two approaches for better use of atlases.

The first suggestion is developing a digital atlas that includes multimedia resources as several teachers recommended. Previously, several researchers have suggested developing a digital atlas as an alternative version of a paper-based atlas (Rystedt 1995; Thomas et al. 1999). Specifically, Jeong and Shin (2007) developed a digital atlas for high school geography class in South Korea using Esri's ArcIMS, a web-based GIS application. According to Jeong and Shin (2007), students in a class with a digital atlas showed higher scores in tests and interest than students in a control group. In other words, using a digital atlas can improve quality of geography learning by increasing students'

engagement in class and incorporating various spatial functions in GIS, although limited access to computer technology may continue to be an issue (Jeong and Shin 2007). A digital atlas can solve several identified obstacles to using current middle school atlases. First, it can be easy to provide up-to-date information on a digital atlas, so teachers would be able to introduce the most current information. As described earlier, one source of teachers' dissatisfaction was outdated resources for atlases because the content of atlases has remained the same under the current version of the national curriculum. However, it may be possible to update or modify information in a digital atlas when it is necessary. Second, because there is no need to bring an atlas to the class, students would not complain about the physical size and weight of atlases, and teachers can use it whenever they need to. Simply converting paper-based atlases to digital ones would not solve all the problems. For better use of digital atlases in class, it is important to provide an appropriate level of resources for middle school students by adding input from a group of students and teachers before publishing atlases.

The second suggestion is improving teachers' expertise. The results of this study showed that teachers' lack of academic background in geography and maps can be one factor for not using atlases frequently in their classrooms. Under the current teacher qualification policy, both social sciences and geography majors with education training can teach middle school social studies courses (Ministry of Education 2015). Since each grade curriculum covers both geography and social sciences content, these teachers should teach content knowledge areas that they have not professionally covered from their education training. It has been serious issues in Korean middle school social studies education (Jho 2006). The ideal solution would be the separation of geography and social sciences into individual subjects and teaching one subject for each grade level (e.g. geography for the 7th grade and social sciences for the 9th grade). That way, teachers can teach their area of expertise, and it would be certainly helpful for students' learning.

An additional solution for improving teachers' expertise would be providing in-service training for teachers with a social sciences background or any teachers who need additional training. For teachers who do not have a background in maps in general, training in basic cartographic principles and theory (e.g., scales, symbolization, projections, and map design process) should be a priority. Such knowledge and information is necessary when teachers teach students how to read maps and use atlases. Once teachers learn about maps, they need to practice how to teach with maps, which means "using maps to help students learn key social studies concepts and relationships," (Bednarz et al. 2006, p. 399) because knowing about maps does not guarantee effective teaching with maps. When teachers are successful at teaching with maps, students may be able to gain knowledge through maps and enhance their spatial thinking and problem-solving skills (Bednarz et al. 2006).

Students are the main users of middle school atlases, and teachers can control the actual use of atlases in classroom. Therefore, it is important to develop and design middle school atlases based on teachers' and students' opinions and demands. Their suggestions can ultimately lead to useful and effective atlases for students' social studies learning.

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