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【研究論文】

An evidence-based physical education curriculum assessment in the Republic of Korea: Can we respond to students' voices?

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The purpose of this study was to examine the actual condition of students' learning in physical education (PE) classes and the effectiveness of the PE curriculum revision in the Republic of Korea (ROK) according to the results of a 2013 survey. Firstly, we considered the backgrounds and the major points of ROK's national PE curriculum revised in 2007, 2009, and 2015. Secondly, we examined the effectiveness of the revisions using the results of a 2013 survey. The survey used the Learning Career Assess Scale (*LCAS*; Unno 2011; Unno et al. 2013a). The sample consisted of 507 (7th grade), 451 (9th grade), and 424 (university freshmen) students from all over ROK. ROK has revised its national PE curriculum on an unprecedented scale and prepared to manage the curriculum quality. The survey responses showed significant differences between male and female students in the three dimensions of Learning Product, Learning Attitude, and Teachers' Instruction. These differences existed at all school stages. Middle school students had the lowest scores for most factors, but we could not identify the cause of the decline of scores in this school stage. As significant differences found in all the dimensions of *LCAS*, it seems that an issue for PE curriculum management in ROK is how to reduce these differences using evidence concerning the condition of students' learning in PE class.

Key words: curriculum management, physical education, actual condition of students' learning

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1. Background

During the last two decades, East Asian countries have seen an expansion of citizens' engagement with sports. Their interests include not only playing and watching sports but also talking about sports events, supporting teams, and reading about sports. At the same time, as lifestyles change due to urbanization, there has been an increase in problems such as a lack of physical activities, decrease in physical fitness, and childhood obesity, which affect the basis of sport and physical literacies. To cope with these problems, within the last two decades, many East Asian countries have revised their physical education (PE) curricula. The intention behind the revisions is to facilitate students' acquisition of "advanced learning ability" as well as an "attitude toward sports and sense of value of sports" beyond general knowledge and basic skill.

The process of curriculum management follows a four-stage cycle: design, implementation, assessment, and revision. In addition, the process includes three dimensions: national, local, and school. At each stage, the curriculum design draws educational contents from the contemporary tidemarks of science and culture, with a view to the national-local educational demand, and includes content appropriate for each subject and school stage. When the intended curriculum is implemented, teachers create lesson plans based on their

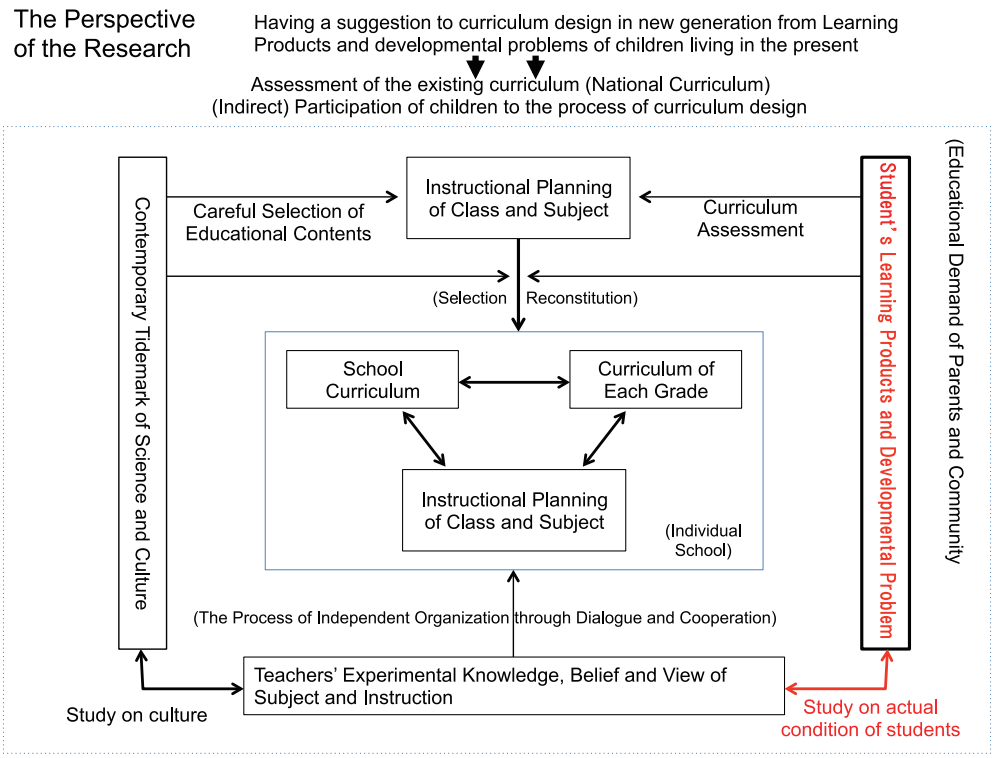

Fig. 1 The Concept Framework of the Curriculum Management

students' development and learning achievements, and they may adapt the curriculum to reflect their specialized knowledge, beliefs, or views on a topic. The lesson plans may be modified according to the progress of learning and teaching. The implemented curriculum embodied by the teaching behavior leads to students' learning achievement, and, in turn, the "attained curriculum" is encouraged or limited by students' Learning Attitude (as being nurtured by teachers' instruction).

As mentioned above, the curriculum should be suitable for the educational precondition as well as students' social-economical-cultural status, developmental status, and learning achievements. Consequently, the intended and implemented curricula must be assessed with an understanding of the real conditions of learning products and students' recognition of teachers' instruction, so that appropriate revisions can be made (see Fig. 1).

However, in our opinion, it can hardly be said that the national curriculum has been revised based a substantive understanding of students' learning products and students' understanding of teachers' instruction[11)13)16)]. Indeed, though the national PE curriculum in Republic of Korea (ROK) was revised multiple times in quick succession (i.e., in 2007, 2009, and 2015), few efforts have been made to examine the impact of the revisions based on students' learning in PE classes. Similarly, in Japan, the Japanese Society for the Pedagogy of Physical Education identified a need to survey students' achievement in PE. Along these lines, the revisions to ROK's PE curriculum should be evaluated in terms of their effectiveness with evidence from PE classes.

2. Purpose

This research is intended to serve as a basis for improving PE pedagogy and to shed light on a common issue facing East Asian countries by examining the effectiveness of the PE curriculum revisions in both ROK and Japan, which have similar educational administration systems, namely, ones that are highly centralized. The purposes of the study are 1) to clarify the condition of students' learning in PE and 2) to examine the effectiveness of the PE curriculum revision in ROK according to the results of a 2013 survey, focusing on student perspectives.

3. Methodology

We begin by considering the backgrounds and major points of the 2007, 2009, and 2015 revised PE curricula. To do this, we examined the curriculum

documents as well as the accompanying explanation documents in terms of philosophy, objects, contents, teaching and learning methods, and student evaluation.

Secondly, we investigated the effectiveness of the revisions using the results of a survey administered in 2013 in ROK. The survey used the Learning Career Assess Scale (*LCAS*), which comprises three dimensions (48 items in total): Learning Product (4 factors; 12 items), Learning Attitude (4 factors; 12 items), and Teachers' Instruction (6 factors; 24 items).

LCAS is based on the following theoretical hypotheses, also summarized in Figure 2.

1) Students' Learning Products are affected by their Learning Attitude toward PE classes;
2) Their Learning Attitude is affected by the Teachers' Instruction; and
3) The teaching and learning processes depend on the fundamental condition of the learning environment.

The survey participants were 7th and 10th grade students and first-year university students from all over the ROK. This was to avoid any pressure from their teachers (see Table 1). The survey was implemented from March to May in 2013, the response rate was 87.4% and valid response was 69.1%. A statistical analysis of the data was performed with the SPSS program package ver. 22.0.

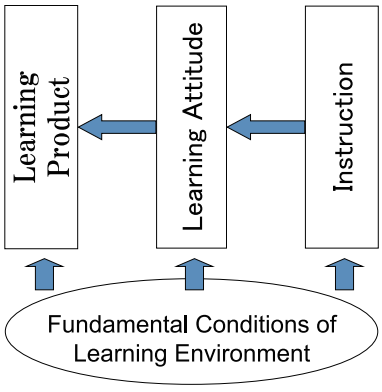

Fig. 2 The Hypothesis of LCAS

Table 1 Survey participants

	Male	Female	Total
7th grade	234	273	507
10th grade	223	228	451
Freshmen	224	200	424
Total	681	701	1,382

4. Results and Discussion

(1) Background and Major Points of the PE Curriculum Revision in ROK

In ROK, the national PE curriculum was amended in 2007, 2009, and 2015 according to the revision of the general principle of the national curriculum. The 2007 PE curriculum revision has been called the largest yet in both breadth and depth. Indeed, the PE curriculum philosophy changed from being centered on movement and/or sports skills to focusing on "five values" of physical activities. This shift brought about substantial changes in various aspects of the PE curriculum[1)-3)].

Next, the 2009 revision was aimed at materializing measures to develop the "core competencies" expressed in the general remarks (i.e., creativity, character, concern for others, and sharing) and to solve the problems that had arisen in PE classes as a result of the previous changes[4)].

Finally, the 2015 revised PE curriculum emphasized improving the methods used for learning and teaching as well as those used for evaluating students, in order to clarify the subject competencies and their relation with the core competencies. Simultaneously, it included efforts to solve long-standing problems[5)-8)].

In what follows, we describe the backgrounds and major points of the 2007, 2009, and 2015 revisions.

1) Background of the 2007 and 2009 Revisions

As indicated in Table 2, the revisions of the ROK's national PE curriculum in 2007 and 2009 reflected national and social demands, especially the goals of increasing the competitiveness of educational quality and keeping step with global trends such as transitioning from a focus on fundamental knowledge and skills to an emphasis on academic learning abilities such as critical thinking and problem solving. Additionally, the correspondence with the decline of children's physical fitness and increase in childhood obesity rates have been emphasized in connection with the issue of public health.

At the same time, the philosophy of PE and the constitutional principles of the curriculum contents have changed alongside amendments to the national curriculum as a whole. For instance, the 2009 revised PE curriculum emphasized students' development of the core competencies needed to live in future society,

Table 2 The Backgrounds and Major Points of the PE Curriculum Revisions in 2009 and 2015

		The 2015 Revised National PE Curriculum	The 2009 Revised National PE Curriculum
The Internal and External Backgrounds of the PE Curriculum Revisions	Internal Backgrounds	1. The demands to improve the position of PE as a school subject in the school education through the discussion to clarify to what PE could contribute for the attainment of the educational purpose. 2. The necessity to reflect the recent worldwide change of the PE philosophy, form the acquisition of sport skill to the development of the active life skill, to National PE Curriculum. 3. The demands to divert the PE philosophy from acquiring sport skill to acquiring more broad range of value of physical activities has recognized in Korea.	There are five internal demands: 1. to solve the problems arose from the rapid-firing revision from 2007 to 2009. 2. to cope with many improvements in the 2007 revised curriculum, such as the switch of the philosophical viewpoint, new goals and contents centered on the values of physical activity, the autonomy of curriculum management granted to each school and teacher. 3. to revise the level and scope of the contents inconsistent with actual condition of the students' development and abilities. 4. to present the meaning and actual method to select the physical activities specifically. 5. to characterize, differentiate and materialize the optional PE course in high school.
	External Backgrounds	1. The demands to check the decline of students' physical fitness and to solve the problem of their health through the reinforcement of health education. 2. The demands to reinforce new activity-centered leisure education to associate with introduction of the five-day week system.	There are three external demands: 1. to developed the PE curriculum along with the curriculum system indicated in the general principle of the 2009 national curriculum (ex. the revision for development of the core competency—creativity, personality, thoughtfulness and commonality, the establishment of grade stages, the alternation in the period of common curriculum, etc.). 2. to modify the PE curriculum content appropriately and reinforce the coordination among subjects and grade stages (ex. the careful selection and reduction of contents, the resolution of the overlap among the subject contents, etc.). 3. to incorporate national and social issues such as education for creativity and personality into the national curriculum (i.e. integration of the improvement of academic achievement and creativity-personality education).
The major pints of the revision		1. Nature of PE: the affirmation of the values of physical activities. (1) The presentation of the educational values of PE developmentally through the unification of the internal and external value of PE. (2) The presentation of the expected image as the outcome of 8 years of PE. (3) The composition of the curriculum contents based on the five value of physical activity. 2. Objective: the unity and comprehensive- ness of the content composition; the presentation not by the learning domain (cognitive, psycho-motor and emotional) but by the value domain of physical activity unified and comprehensive. 3. Content; (1) The content system based on the value of the physical activity. (2) The unification of the content domains and the emphasis of systematization of the contents. (3) The autonomous selection of the physical activities as the teaching materials. 4. Teaching and Learning Method: the emphasis on the fundamental direction (severalty, unity and creativity) and the establishment of the plan for teaching and learning in PE. 5. Evaluation: the emphasis on the validity and the diversity of the evaluation.	1. The reflection of the national and social request about creativity and personality education to the PE curriculum (i.e. nature, objective, teaching and learning method and evaluation were improved and supplemented with the contents for creativity and personality education). 2. The rationalization of the curriculum contents in order to cope with the measures to vary the time for the subject group within 20%; (1) the reduction of amount of learning through the integration of the middle content domains in Health Activity; (2) the reduction, transfer or replacement of the curriculum contents. 3. The presentation of the system of the curriculum contents every grade group and the classification the contents by each grade for the support in teachers' selection of the contents by each grade. 4. The materialization of the selection criterion of the physical activities and the comprehensive exemplification of the activities in order to select the appropriate activities according to the actual condition and prerequisite of each school.

Source: This Table is made of the abstract of All the materials herein are derived from Korean Ministry of Education and Human Resources (2006)[1)] and Seo et al. (2010)[12)].

and contents related to creativity and character education have been allocated to every content domain in the PE curriculum.

2) Major Points of the 2007 and 2009 Revisions

The most important change is the transition of the constitutional principles of the curriculum contents from the learning domain (cognitive domain, psychomotor domain, and emotional domain) to the domain of the value of physical activity: i.e., the value of health, challenge, competition, expression, and leisure. According to this transition, the construction of the objective and direction for organization of the curriculum contents has changed drastically. Individualization of learning has increased, and teaching methods are adapted to fit students' various differences in movement ability, interest, gender, and so forth. Furthermore, in the methods used to evaluate students, efforts are made to reduce the weight of sports skills and assure a well-balanced evaluation. This includes diversifying the evaluation methods and tools[10].

3) The Major Improvement in 2015

Building on the results and issues of the previous two revisions, the 2015 revised ROK's national PE curriculum introduced changes in line with the common changes specified for all subjects:

1) Introduction of subject competencies: health care, body training, competitive performance, and physical expression (in contrast to the equivocal competencies of "physical fitness and movement ability," "creative and rational thinking" and "sports spirit and sense of community," found in the 2009 revised ROK's national PE curriculum);
2) Reorganization of the content structure: key concepts – generalized knowledge – content elements – functions;
3) Specification of achievement standards (e.g., see the standards for Net-type games below);

[Net-type games]
Students are expected
○ to understand the history and characteristics, and investigate, and analyze the competition style, related persons, records, and events of net-type games;
○ to understand the skills and scientific principle of each type of game and apply those contents to the game, then analyze and solve the problems that arise in the game;
○ to understand the rules and strategies of the game and utilize, select, and apply those contents creatively in the game situation;
○ to observe the rules and respect not only teammates but also opponents, as well as the referee and spectators.

4) Optimization of the amount of learning;
5) Improvement of teaching and learning methods and evaluation methods.

4) Management of Curriculum Quality and the Ground for Revision

As the major point about curriculum management in the 2007 and 2009 revisions, the autonomy of each school was emphasized in the design and implementation of the curriculum. Each school and teacher was permitted to choose the time allocation for PE classes with a limit of 20%.

There is some anxiety about whether adequate time can be allocated to PE given the overemphasis on intellectual education. Another question is whether every school can provide the full range of PE curriculum contents, since some lack adequate facilities and PE equipment.

On the other hand, the transfer of the authority to manage the curriculum to each school and teacher has raised awareness of the necessity of managing the quality of the PE curriculum. Measures to manage curriculum quality have been developed, and a system has been established to supplement the ROK's national PE curriculum with standards and rubrics for academic achievement in PE.

In this respect, specifying the achievement standards in the 2015 revised curriculum is helpful to formulate the PE evaluation standards at the school and teacher level, though there is some risk for the overall ROK's national standardization if a school-based curriculum and learning and teaching methods emerge.

Incidentally, it should be pointed that the actual conditions of students' learning in PE class, that is, student voices, are hardly reflected in the revisions or given attention in the revision process, as far as we are aware. Concerning this problem, Seo et al. (2010)[12] stated,

Because the assessment of academic achievement at the national level has not been implemented for all the required common subjects in compulsory education, there are no opportunities for teachers of PE, Music, and Fine Art, as school subjects that are not intellectual ones, to identify problems in student achievement based on the educational objectives and contents defined in the national curriculum. Therefore, inefficiency in education reflects the purely theoretical basis, and the precedents and academic trends of other countries have been continued because of the failure to obtain positive evidence on achievement and to confirm the relevance of the educational contents and method, regardless of the multiple revisions to the national curriculum. (p. 227)

What should be noticed here is that the assessment of achievement in PE from now onward should be implemented consistently from the viewpoint of the question, "To what extent have students acquired the contents that the ROK's national curriculum intended them to acquire?" When the ROK's national curriculum is revised, as a matter of course, the contents of a curriculum assessment also change. In other words, because the PE curriculum contents were modified multiple times, a longitudinal assessment is difficult. Moreover, an assessment from this viewpoint does not show how students recognize the teachers' instruction or what attitudes and sense of value they develop concerning PE class.

To discuss this problem, it is useful to consider the results of the questionnaire survey carried out by Kueon et al. (2009)[9]. The survey asked teachers, parents, and students about their perceptions of PE class and school sports. Table 3 shows the responses to selected items.

The survey results indicate many students participated in PE class positively, and they perceived the various values of PE class. However, it remains unclear what context facilitated the students' attitudes and perceptions of the value of PE class, namely, what kind of teachers' instruction and learning methods were helpful.

Let us, for the moment, consider the results of our survey to clarify the relations among Learning Product, Learning Attitude, and Teachers' Instruction for PE classes.

(2) Actual Condition of Students' Learning in PE Class

1) Learning Products

The Learning Product dimension of *LCAS* is composed of four factors: Collaboration and Cooperation, Practical Knowledge, Motor Competency, and Pleasure. A comparison of each factor and total score by gender and school stage showed that the male students had significantly higher scores than the female students for all factors. The same tendency emerged in the results of the survey in 2010 (intended for primary school). Therefore, the gender gap may be a feature of PE classes in ROK. In addition, though there were no significant differences, middle school students of both genders had the lowest scores for most factors (see Table 4 and Fig. 3).

It is suggested that, from the viewpoint of Learning Product, ROK's PE curriculum has two issues to resolve: the gender gap and the curriculum gap or the disconnection between school stages. With respect to the gender gap, the 2007 revised PE curriculum introduced a new key point, classifying teaching strategies according to students' differences. The results show, however, the gender gap in PE class remains regardless of the effort to bridge the gap at the curriculum design stage. Bridging the gender gap in PE class is an issue facing not only ROK but also many other countries. Since the issue concerns the essential attributes of PE, it is necessary to reconsider PE's aims and objectives, contents, teaching and learning methods, and methods of evaluation.

Another issue is the disconnection of the PE curriculum among school stages. Unno (2011)[14] described this disconnection in Japan and how it was resolved. The Japanese Ministry of Education, Culture, Sports, Science and Technology revised the PE curriculum to divide it into three developmental stage, 1st–4th grade, 5th–8th grade, and 9th–12th grade, in consideration of the connection between primary and middle school. Similarly, as a modification of the 2007 revised PE curriculum, the 2009 curriculum reorganized the contents and examples of elective physical activities according to the hierarchy of the content system corresponding with the value of physical activity. The process of quality management of the PE curriculum should include consideration of whether the disconnection of the PE curriculum can be resolved or not along with the establishment of the curriculum at each school.

Table 3 The Perception about the PE Class of Teachers and Students

Question	Teachers	Students
To what degree do you think the importance of PE as a school subject in school PE?	Extremely important: 21% Important; 32% Neutral: 30% Not important: 16% Extremely not important; 1%	Extremely important: 9% Important; 24% Neutral: 44% Not important: 18% Extremely not important; 5%
Next question is about the value of PE class. Please check off according to the importance of each item. (1) Reliving stress (2) Development of personality and morality (3) Cultivating patience (4) Proper posture and physical balance (5) Enhancement of physical fitness and Prevention of obesity (6) Improvement of movement skills (7) Development of democratic attitude to life (8) Development of sociality (9) Basis to lifelong PE (10) Any other ( )	Over half of teachers checked off 'Extremely important' on (4), (5), and 'Important' on (1), (2), (3), (8) and (9).	Over 30% of students check off 'Extremely important' on (5), (4) and (6), and 'Important' on (1), (3) and (9).
To what degree do you think about positive attitude of students to PE class?	Extremely positive: 4% Positive: 38% Neutral: 42% Negative: 13% Extremely negative: 3%	Extremely positive: 15% Positive: 35% Neutral: 40% Negative: 7% Extremely negative: 3%
Next question is about the reason of students' negative attitude to PE class. Please check off according to the degree of your agreement to each reason. (1) Not subject of the entrance exam (2) Content of PE classes are uninteresting (3) Teaching Method is not comfortable to students' level (4) The shortage and luck of facilities for PE (5) PE obstacle to academic work (6) Any other ( )	Most teachers thought (1) as the reason of students' negative attitude, many teacher checked off 'Not rue' an 'Extremely not true' on (2) and (3).	Most students thought (1) as the reason of their negative attitude, many student checked off 'Not true' and 'Extremely not true' on (5), (4), (2) and (3).
Next question is about the things to improve for activation of PE class. Please check off according to the importance of each item. (1) Improvement and expansion of PE facilities; modernity, utility, diversity, etc. (2) Improvement of contents; students' appetite, consideration of time for participation, etc. (3) Improvement teachers' capability: specialty, systematic instruction, genuineness, etc. (4) Improvement and differentiation of teaching method (5) Establishment the status of PE as a school subject quasi the subjects of the entrance exam (6) Any other ( )	Teachers thought (1) and (5) as most important matters for activation of PE class, on another (2), (3) and (4) were listed up to improve.	Students thought (1) and (2) as most important matters for activation of PE class, on another (3) and (4) were listed up to improve.

2) Learning Attitude

Next, let us examine the Learning Attitude dimension. Each factor and the total score of Learning Attitude showed a significant difference between the male and female students; namely, the male students had significantly higher scores than their female counterparts. Except for Compliance with Rules, the high school students had the highest scores for all factors and in total. In particular, the high school students had a significantly high score in the factors of Cooperative Learning, Conscious Learning, and Devotion, as well as in total (see Table 5).

2-1) Types of Learning Attitude

LACS premise includes the hypothesis that the Learning Attitude should dictate the Learning Product. Indeed, it could be expected that students with higher scores of Learning Attitude would obtain higher scores of Learning Product, to the contrary students

Table 4 The Factor Scores of Learning Product

		Primary	Middle	High	School Stage *F*	Gender *F*	Interaction *F*	Multiple Comparison
Collaboration and Cooperation (3–12)	M	9.59	9.16	9.53	2.65	65.65***	1.99	
	F	8.70	8.68	8.74				Male>Female***
Practical Knowledge (3–12)	M	8.85	8.66	9.91	0.74	77.29***	0.63	
	F	8.04	7.96	7.95				Male>Female***
Motor Competency (3–12)	M	9.02	8.72	9.16	3.32*	118.08***	0.68	Middle<High*
	F	7.84	7.80	8.01				Male>Female***
Pleasure (3–12)	M	9.86	9.54	9.61	1.76	93.56***	0.25	
	F	8.70	8.55	8.60				Male>Female***
Total (12–48)	M	37.31	36.09	37.21	2.08	118.80***	0.78	
	F	33.27	33.00	33.29				Male>Female***

* p<.05, *** p<.001

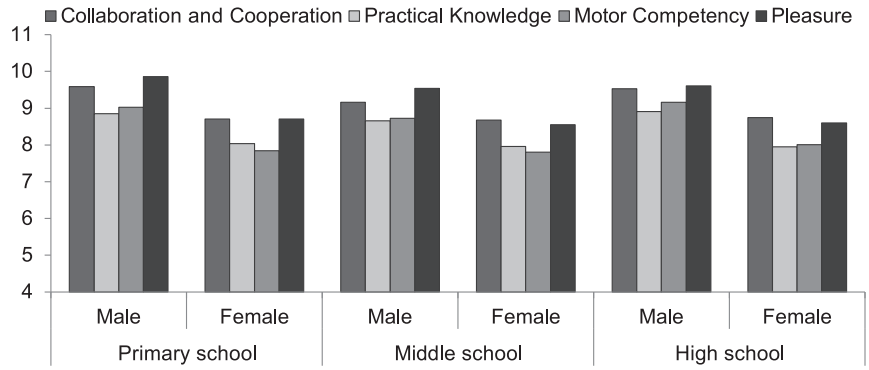

Fig. 3 The Factor Score of Learning Product by Gender and School Stage

Table 5 The Factor Scores of Learning Attitude

		Primary	Middle	High	School Stage *F*	Gender *F*	Interaction *F*	Multiple Comparison
Cooperative Learning (4–16)	M	8.92	9.00	9.19	6.06**	9.02**	0.84	Primary<High**
	F	8.52	8.86	8.97				Male>Female**
Compliance with Rule (4–16)	M	9.39	9.42	9.38	0.56	19.64***	0.64	
	F	9.16	9.00	8.97				Male>Female***
Conscious Learning (4–16)	M	8.39	8.34	8.97	15.27***	77.41***	0.24	Primary, Middle<High***
	F	7.45	7.57	8.08				Male>Female***
Devotion (4–16)	M	8.04	8.35	8.62	15.67***	28.61***	1.51	Primary, Middle<High***
	F	7.57	7.60	8.27				Male>Female***
Total (16–84)	M	34.75	35.11	36.16	9.87***	49.09***	0.06	Primary, Middle<High***
	F	32.70	33.02	34.29				Male>Female***

** p<.01, *** p<.001

Table 6 The Proportion and Characteristics of Each Type of Learning Attitude

	Primary		Middle		High		Kruskal Wallis		Characteristics
	M	F	M	F	M	F	Gender	School Stage	
①Contempt for Rule (N=557, 40.30%)	89	80	84	76	133	95	***	***	The factor scores of "Conscious Learning", "Devotion" and "Cooperative Learning" relatively high, but holding the rule of the game and learning in contempt.
②Refuse Learning (N=632, 45.73%)	103	171	90	133	53	82			This type indicates low score of all factors. That means this type does not learn consciously, take learning environment in consider and cooperate with others.
③Learning-oriented (N=193, 13.97%)	42	22	49	19	38	23			This type is an ideal attitude that indicates highest score of all factors. It attends PE classes consciously, learns with friends cooperatively, considers his/her surroundings and complies the rule of games and classes.

*** p<.001

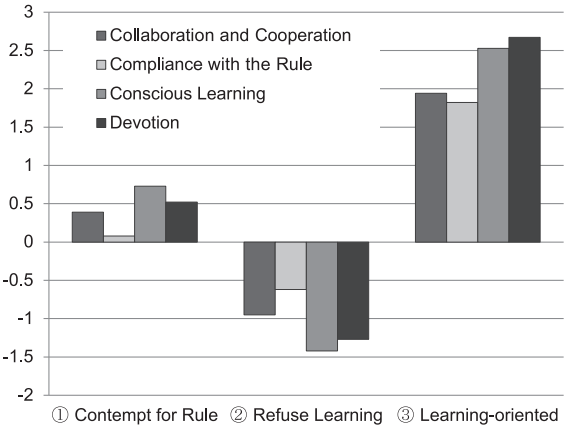

Fig. 4 The Results of Cluster Analysis of the Learning Attitude

and those with lower scores of Learning Attitude would obtain the lower scores of Learning Product insufficiently. Therefore, we carried out a cluster analysis adopting the Ward method to the data of Learning Attitude in order to examine the relationship between Learning Attitude and Learning Product.

Through the cluster analysis, three types of Learning Attitude are extracted (see Table 6 and Fig. 4). Type 1 obtained relatively high scores in the Conscious Learning, Devotion, and Cooperative Learning factors, but their factor score for Compliance with Rules is lower; this group is called "Contempt for Rules."

Type 2 showed the lowest scores for all factors, so they are named "Refuse Learning." This type showed extremely low scores in Conscious Learning and Devotion.

Type 3 had the highest scores for all factors, especially Conscious Learning, and Devotion. Therefore, we named this type "Learning-oriented."

Figure 5 shows the distribution of the Learning Attitude types. The proportions show significant differences by both gender and school stage. For example, a larger percentage of female students fall into the Refuse Learning category at all school stages. On the other hand, a larger percentage of male students are classified as the Contempt for Rules type and Learning-oriented type at all school stages. For primary school students, the Refuse Learning type is the most common among both male and female students. The percentage of students in the Contempt for Rules type grows along with the advance of school stage. The Learning-oriented type is the least frequent of the three types for both gender groups and all school stages.

The revised PE curricula of 2007 and 2009 sought to promote students' participation in PE class by adapting teaching strategies to students' differences. Regardless of these intentional efforts, at the time of survey, nearly half the students held the Refuse Learning type of Learning Attitude. This demonstrates that such efforts are important. Indeed, the 2015 revised curriculum also focuses on the improvement of learning and teaching processes through adopting teaching strategies to cope with differences of students' attributes and self-directed learning. Given that the improvement of teaching strategies has been repeatedly advocated in ROK, it can be said that the success of the 2015

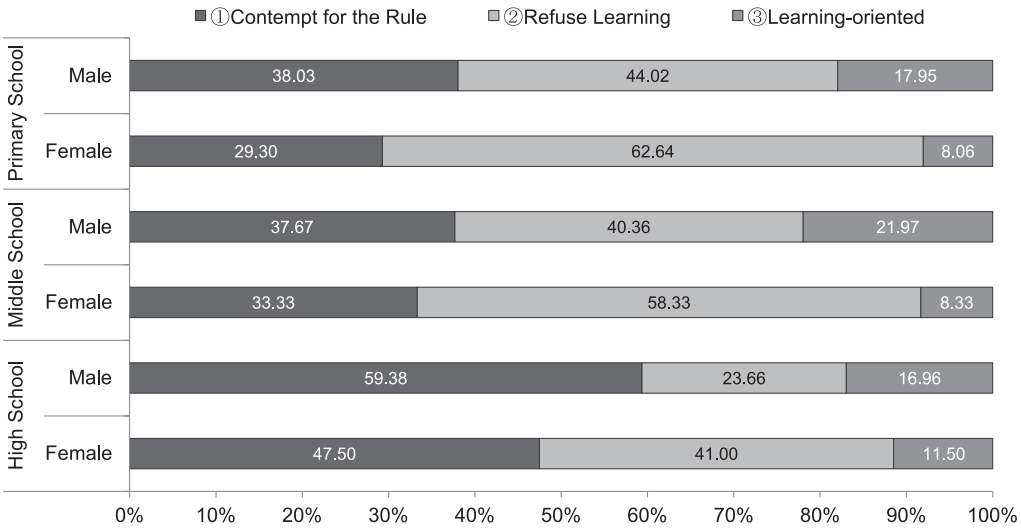

Fig. 5 The proportion of Learning Attitude by School Stage and Gender

Table 7 The Factor Scores of Learning Product by the Type of Learning Attitude

	Collaboration and Cooperation			Practical Knowledge			Motor Competency			Pleasure		
	Primary	Middle	High	Primary	Middle	High	Primary	Middle	High	Primary	Middle	High
①Contempt for the Rule	9.63	9.47	9.30	8.94	8.88	8.68	8.96	8.86	8.73	9.96	9.69	9.24
②Refuse Learning	8.39	8.03	8.30	7.63	7.30	7.30	7.54	7.23	7.69	8.34	8.05	8.17
③Learning-oriented	10.84	10.54	10.51	10.39	10.29	10.15	10.48	10.18	10.23	11.11	10.75	10.85
School Stage Multiple Comparison	Middle<High* ③>①>②***			③>①>②***			③>①>②***			③>①>②***		

* p<.05, *** p.001

curriculum revision depends on whether PE teachers can change their teaching strategies to encourage students to participate in PE class substantially.

2-2) Relation between Learning Product and Learning Attitude

How do the types of Learning Attitude dictate Learning Product? In other words, what sort of relation exists between the type of Learning Attitude and the gender gap of Learning Product or the disconnection of the PE curriculum among school stages?

Regardless of Learning Attitude type, the Learning-oriented type has the highest score of Learning Product, and the Contempt for Rules type has a moderate score. The Refuse Learning type has the lowest score for all factors. Moreover, the factor score of each school stage hardly shows significant differences. Only on the factor score of Cooperative Learning, high school students have a significantly higher score than middle school students (see Table 7).

It is inferred that the gender gap of Learning Product is drawn from the gap of Learning Attitude between male and female students. The proportions of the Refuse Learning type for male students in primary and middle school are by no means low (primary school: 44.02%; middle school: 40.36%), but for female students, the proportions are higher (primary school: 62.64%; middle school: 58.33%). This means over half of the female students at these school stages have acquired a negative attitude toward learning in PE class.

3) Teachers' Instruction

Which factor of Teachers' Instruction affects the difference of the Learning Attitude types between male and female students? To begin with, the factor score of Teachers' Instruction is explored. After all, there is a significant difference between the male and female students on all factor scores except for Sympathetic Atmosphere. High school students have

Table 8 The Factor Scores of Teachers' Instruction by School Stage*Gender

	Primary		Middle		High		School Stage	Gender	Interaction
	M	F	M	F	M	F	*F*	*F*	*F*
Teaching How to Learn (4–16)	12.00	11.12	11.82	11.22	13.38	11.44	4.55**	51.28**	0.84
Encourage Interaction (4–16)	12.30	11.56	12.23	11.56	12.21	11.59	0.04	32.37***	0.80
Sympathetic Atmosphere (4–16)	12.00	11.35	12.00	11.67	12.13	11.87	2.95	13.46	1.21
Cognitive Learning (4–16)	10.38	9.52	10.82	10.10	10.46	9.87	5.85**	33.99***	0.39
Disciplined Learning (4–16)	11.50	11.02	11.86	11.32	11.83	11.42	6.86**	27.63***	0.17
Challenging Atmosphere (4–16)	10.52	9.88	10.88	10.02	10.66	9.91	1.92	47.82***	0.41
Total (16–96)	68.68	64.45	69.61	65.87	69.97	66.09	2.71	55.47***	0.14

** p<.01. *** p<.001

Table 9 The Proportion and Characteristics of the Type of Teachers' Instruction

	Primary		Middle		High		Kruskal Wallis		Characteristics
	M	F	M	F	M	F	Gender	School Stage	
①Absence of Educational Content (N=765, 55,35%)	112	174	105	148	106	120	***	n.s.	All factors show bad (minus) score, especially "Cognitive Learning", "Sympathetic Atmosphere" and "Teaching How to Learn" show bad score.
②Corresponding with Learning (N=455, 32.92%)	101	60	97	48	95	54			All factors show the highest score, especially "Cognitive Learning", "Encourage Instruction" and "Teaching How to Learn" show pretty high score. So it seems the ideal type of Teachers' Instruction.
③Abdicate Instruction (N=162, 11.72%)	22	39	21	31	23	26			All factors show lowest score, especially "Encourage Instruction", "Cognitive Learning" and "Teaching How to Learn" show pretty bad. So it seems that teachers abdicate instruction in PE classes.

*** p<.001

a significantly higher score than primary and middle school students on the factors of Teaching How to Learn and Disciplined Learning (see Table 8).

3-1) Type of Teachers' Instruction

To analyze the relation between the condition of Teachers' Instruction and type of Learning Attitude, we carried out a cluster analysis with the Ward method. As the results of the analysis, three types of Teachers' Instruction were extracted (see Table 9 and Fig. 6). The first type showed a negative score on all factors, especially those related to educational content such as Cognitive Learning and Teaching How to Learn. We named this type "Absence of Educational Content."

The second type had the highest score on all factors, particularly Cognitive Learning, Encourage Instruction, and Teaching How to Learn. We inter-

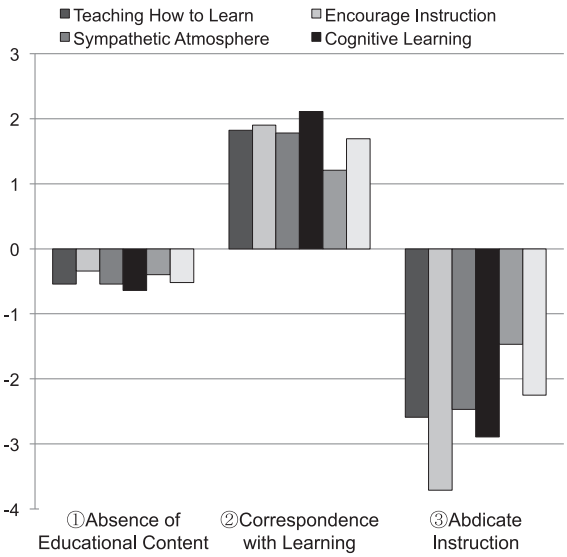

Fig. 6 The Results of the Cluster Analysis to Teacher' Instruction

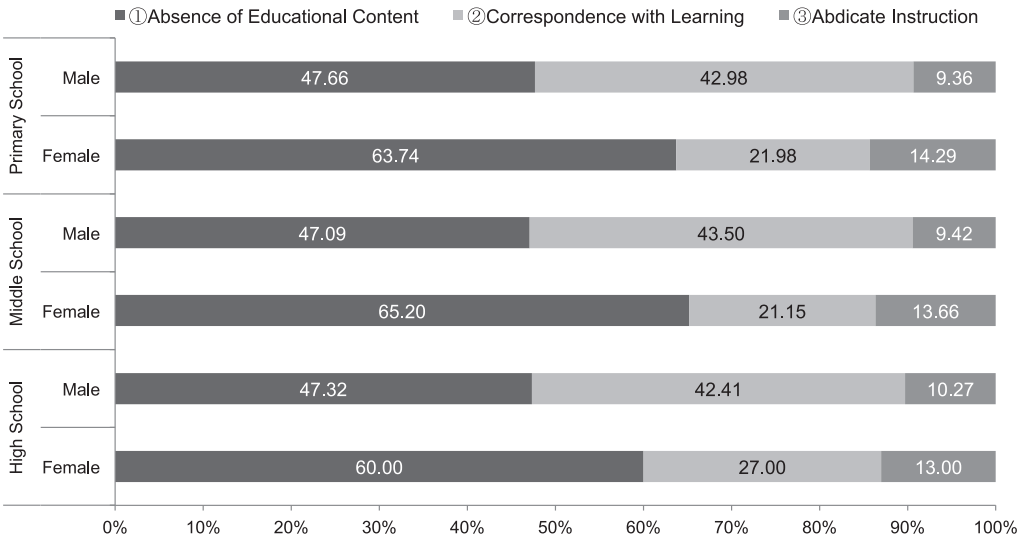

Fig. 7 Proportion of the Type of Learning Attitude by School Stage and Gender

preted this type as an ideal type of Teachers' Instruction and labeled it "Correspondence with Learning."

In contrast to the second type, the third type showed the lowest score on all factors, particularly Cognitive Learning, Encourage Instruction, and Teaching How to Learn. Therefore, we named this type "Abdicate Instruction."

As indicated in Figure 7, the proportion of the types of Teachers' Instruction shows a significant difference by gender, but there are no significant differences by school stage. That is, for all school stages, the female students have higher percentages than the male students in the Absence of Educational Content type and Abdicate Instruction type and lower percentages in the Correspondence with learning type. From these results, it is inferred that the gender gaps in Learning Product and Learning Attitude arise from the type of Teachers' Instruction, which refers to students' recognition and perception of their teachers' actual and concrete teaching behavior in PE class.

As we examined above, a feature of Teachers' Instruction in ROK is that 67% of students perceive and recognize the Teachers' Instruction negatively (the total proportion of the Absence of Educational Content type and Abdicate Instruction type). In particular, 63.14% of female students belong to the Absence of Educational Content type. Almost 76.86% of them perceive teachers' instruction negatively, together with the Abdicate Instruction type.

3-2) Relation between Learning Product and Teachers' Instruction

What relationship is found between Teachers' Instruction and Learning Product, then Learning Attitude?

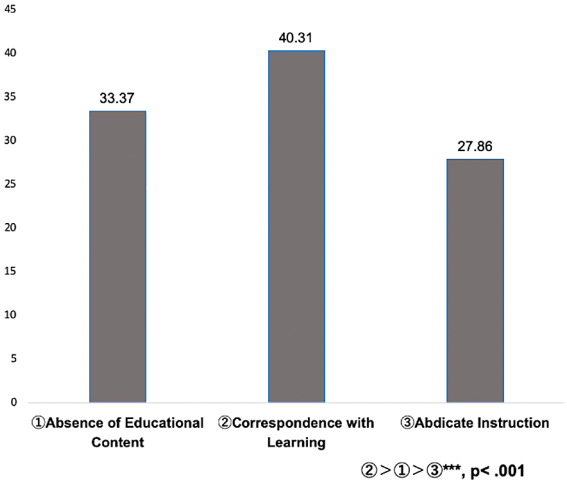

Fig. 8 The Total Score of Learning Product by Each Type of Teachers' Instruction

Firstly, let us discuss the relationship between Teachers' Instruction and Learning Product. The total score of Learning Product shows a significant difference among the types of Teachers' Instruction, and it is higher significantly, in order, from Abdicate Instruction to Absence of Educational Content and Correspondence with learning (see Fig. 8).

Secondly, to discuss the relationship between Teachers' Instruction and Learning Attitude, we compared the proportion of Learning Attitude with respect to each type of Teachers' Instruction. In the Absence of Educational Content type, which is the most common type, the Refuse Learning type accounts for the highest proportion (55.95%), followed by the Contempt for Rules type. The Learning-oriented type

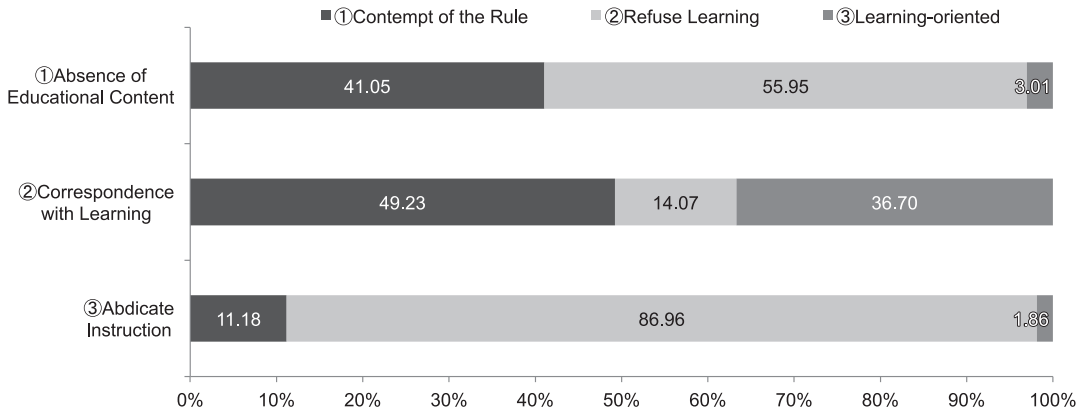

Fig. 9 Proportion of the Type of Learning Attitude by Type of Teachers' Instruction

is slight, with about 3%. Additionally, in the Abdicate Instruction type, the Refuse Learning type accounts for about 87%, and the Learning-oriented type, only 1.86%. In contrast, in the Correspondence with learning type, the Learning-oriented type of Learning Attitude accounts for 36.70%, and the "Refuse Learning" type, only 14.07% (see Fig. 9).

The results show that 67% of the students perceived teachers' instruction negatively: the Absence of Educational Content type and Abdicate Instruction type are apt to make students acquire the Refuse Learning type of Learning Attitude. This relationship leads to the low scores of Learning Product, especially for female students.

Concerning the disconnection of the PE curriculum, the issue exists not between primary school and middle school but between the ROK's national common curriculum and the elective curriculum for high school. In the survey, high school students showed significantly high scores on many factors of Learning Product and Learning Attitude and middle school students showed the lowest scores on many factors, though there was no significant difference between their scores and those of the primary school students. Therefore, it is necessary to clarify what factors contribute to the disconnection between the ROK's national common curriculum and the elective PE curriculum for high school, as well as what factors cause the factor score decrease for Learning Product and Learning Attitude.

4) Degree of Favor and Thoughts on the Helpfulness of PE Class

Given the conditions of PE classes mentioned above, what sense of value have students in ROK acquired concerning PE? In what follows, the relationship between students' views on PE class and Teachers' Instruction is discussed from two viewpoints, the degree of favor toward PE class and thoughts on the helpfulness of it.

We set the inquiry item "*I like PE class*" in the questionnaire to reveal students' degree of favor toward PE class. The results indicated significant differences between middle and high school students, and between male, and female students at all school stages. On the relation between the degree of favor toward PE class and Teachers' Instruction, moreover, the Correspondence with learning type showed the highest score, followed by the Absence of Educational Content type. The Abdicate Instruction type showed the lowest score. There is the significant difference among the three types (see Tables 10 and 11).

The following items were included in the survey to clarify the students' thoughts on the helpfulness of PE class: "*What I learned in PE is useful in daily life,*" "*What I learned in PE will be helpful in the future,*" and "*Taking PE is what it takes to become a good person.*" The male students had significantly higher scores than the female students, and the high school students obtained significant higher scores than the primary

Table 10 The Score of the Degree of Favor toward PE

	Primary	Middle	High	Gender *F*
Male	3.49	3.39	3.50	Male>Female***
Female	3.10	3.01	3.14	
School Stage *F*	High>Middle*			

* p<.05, *** p<.001

Table 11 The Score of the Degree of Favor toward PE by the Type of Teachers' Instruction

	①Absence of Educational Content	②Corresponding with Learning	③Abdicate Instruction	Multiple Comparison
The Degree of Favor toward PE	3.14	3.67	2.74	②>①>③***

*** p<.001

Table 12 The Score of the Cognition of Helpfulness of PE Class

	Primary	Middle	High	School Stage *F*
Male	9.12	9.13	9.77	Primary, Middle<High*
Female	8.18	8.21	8.91	
Gender *F*	Male>Female***			

* p<.05, *** p<.001

Table 13 The Score of the Cognition of Helpfulness of PE Class by each Type of Teacher's Instruction

	①Absence of Educational Content	②Correspondence with Learning	③Abdicate Instruction
	8.47	10.08	7.27
Multiple Comparison	②>①>③***		

*** p<0.001

and middle school students (see Table 12). And on the relation between the cognition of helpfulness of PE class and Teachers' Instruction type, there is a significant difference among three types of Teachers' Instruction, the score is higher from the Abdicate Instruction type, the Absence of Educational Content type to the Correspondence with Learning type (see Table 13).

These results seem to suggest that PE Teachers' Instruction of the Absence of Educational Content type and the Abdicate Instruction type would lead to the significant difference in the Learning Attitude between male and female students; and this difference would cause the significant difference in Learning Product between male and female students. Furthermore, it seems to be suggested that the significant gender difference of Learning Product affects the students' degree of favor to and their thoughts on the helpfulness of PE class. Consequently, the condition of learning in PE class prevents female students from participating actively (see Table 14).

Table 14 The Score of the Cognition of Helpfulness of PE Class by each Type of Learning Attitude

	①Contempt for the Rule	②Refuse Learning	③Learning-oriented
	9.34	7.96	10.40
Multiple Comparison	③>①>②***		

*** p<.001

5. Conclusion and Further Research

This study clarified the features of PE classes in ROK as follows:

(1) **Regardless of school stages, there are the significant differences between male and female students in Learning Product, Learning Attitude, and Teachers' Instruction. Furthermore, a significant difference is found in the degree of favor toward PE class and thoughts on the helpfulness of PE class.**

These findings suggest the existence of gender bias in PE classes in ROK. Namely, the significant difference between male and female students in the category of Teachers' Instruction suggests that the PE teachers' instructional practices in ROK give raise to the gender gaps in PE or at least produces a difference in the students' recognition of the instruction. The Absence of Educational Content type accounts for the largest proportion of Teachers' Instruction and is characterized by a relative low score of Cognitive Learning and Teaching How to Learn. It seems that this characteristic causes female students to participate negatively, reflected in their low scores in thoughts on the helpfulness of PE class.

(2) **Although there is not a significant difference in the scores of Learning Product and Teachers' Instruction, a significant difference appears in**

Learning Attitude and thoughts on the helpfulness of PE class.

The reason for this matter is not clarified by the survey results. Therefore, it should be discussed from a wider perspective. The survey participants were 7th and 10th grade students and first-year university students, and their curriculum experiences differed by school stage. That is, the 10th, and 7th grade students had taken PE classes under the 2007 revised PE curriculum for three years, but the first-year university students had less experience.

Concerning the difference in students' experiences with the curriculum, it should be pointed out that regardless of the difference of school stage and curriculum experience, there are few differences in Teachers' Instruction. The 2007 revised PE curriculum changed the focus of the curriculum philosophy from sports skills to the value of physical activity. Further, it emphasized the development of teaching and learning methods as well as the understanding and implementation of the principle and value of physical activity. The remaining question is why the scores of Learning Product and thoughts on the helpfulness of PE class are low for primary and middle school students, despite the curriculum changes. One possible reason is an insufficiency of the major points of the 2007 curriculum revision.

The 2015 revised ROK's national PE curriculum, in comparison with the 2007 and 2009 curricula, seems to be more consistent with the competency-oriented direction of the ROK's national curriculum as a whole because it specifies an achievement standard and revises the content structure. The most serious issue, however, is to improve the quality of teaching at the implementation stage. On this point, the 2015 curriculum has showed no significant changes that are sufficient for overcoming the long-standing problems in PE. To examine the effectiveness of this revision, we need to resurvey students' learning in PE classes in ROK at the stage the transition to practical implementation.

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