



## A case study of learning perspective about baseball-type physical education classes among Japanese university students aspiring to become health and physical education teachers

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### ABSTRACTS

This study aimed to clarify the characteristics of learning perspectives on baseball-type physical education classes among Japanese university students enrolled in a health and physical education teacher training program by comparing them with perspectives on general physical education classes. A questionnaire survey was conducted with 67 first-year university students, and paired t-tests were performed across five learning domains. The results indicated that students perceived baseball-type physical education classes as contributing significantly less to the improvement of physical abilities than general physical education classes ( $t = 2.01$ ,  $p = 0.049$ ,  $d = 0.25$ ). In contrast, no significant differences were found in the domains of acquisition of motor skills, development of communication skills, acquisition of knowledge about the body and movement, or appreciation of the attractiveness of physical activity. These findings suggest that students tended to perceive baseball-type physical education similarly to general physical education in most learning domains, despite the distinctive characteristics of baseball-type activities. The study highlights the importance of teacher training programs in fostering a multifaceted understanding of the educational characteristics and learning outcomes of baseball-type physical education.

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## INTRODUCTION

In 2015, the Central Council for Education in Japan emphasized the importance of cultivating competent teachers in teacher training programs. In particular, the development of teachers' competencies related to instructional practices has been increasingly demanded (Inamoto & Miyamoto, 2023). Since classroom teaching is considered one of the most important contexts for evaluating teachers' professional competence (Oyama & Morikawa, 2024), understanding the factors that shape instructional practices is essential for improving teaching ability.

One of the key factors influencing instructional practices is teachers' instructional beliefs. Calderhead (1996) highlighted that teachers' personal beliefs regarding teaching and learning strongly affect their instructional decision-making and classroom practices. Similarly, Ishigami (2006) argued that instructional beliefs influence both lesson planning and instructional implementation. However, university students enrolled in teacher training programs generally lack extensive teaching experience, making it difficult to regard their instructional beliefs as fully developed professional beliefs (Shiraishi et al., 2020). Instead, their understanding of teaching is often grounded in their own experiences as learners during their non-teaching phases. From this perspective, the concept of learning perspectives becomes important. According to Suzuki (2011), learning perspectives refer to learners' beliefs about the nature and meaning of learning. Furthermore, Ito & Ito (2014) suggested that students' learning perspectives can serve as a basis for the later formation of instructional beliefs. In other words, the ways in which preservice teachers interpret their own learning experiences may influence how they later design, implement, and evaluate instructional practices. Therefore, clarifying students' learning perspectives in the early stages of teacher education is meaningful not only for understanding their current perceptions of physical education but also for considering the future development of instructional practices. In contemporary school settings, issues such as declining physical fitness and widening disparities between physically active and inactive children have become major educational concerns (MEXT, 2018, 2019). In response to these issues, it is especially important to examine how future physical education teachers perceive the educational significance and learning outcomes of physical education.

Against this background, a number of studies have examined learning perspectives among students enrolled in health and physical education teacher training programs. Shiraishi et al. (2020) found that incoming students already possess relatively well-formed beliefs regarding what should be learned through physical education. Eto & Mita (2023) further demonstrated that these perspectives can change through coursework related to physical education pedagogy, particularly regarding the importance of "acquiring motor skills," "developing communication skills," and "learning knowledge about the body and movement." In addition, Nagashima (2025) reported that students in teacher training programs tend to prioritize

“learning,” “enjoyment,” and “achievement” in physical education. Furthermore, Anii et al. (2025), through qualitative analysis, suggested that students view physical education as an opportunity to foster social skills and cooperation while placing enjoyment at the center of learning experiences. Collectively, these studies suggest that learning perspectives are shaped both by students' prior learning experiences and by teacher education programs themselves.

However, despite this growing body of research, previous studies have primarily examined learning perspectives toward physical education in general, treating physical education as a relatively unified subject area. As a result, limited attention has been paid to whether preservice teachers perceive different activity types as having distinctive educational characteristics and learning outcomes. This issue is important because physical education consists of a variety of movement forms and sports, each involving different pedagogical structures, movement demands, and patterns of learner interaction. Therefore, students' learning perspectives may vary depending on the characteristics of specific activity types. Among these activity types, baseball-type physical education warrants particular attention. Previous studies have pointed out that baseball-type activities are often difficult to implement effectively in school settings because of constraints related to space and equipment (Ota et al., 2022). In addition, Omuro et al. (2021) noted that large skill gaps between experienced and inexperienced students can make baseball-type instruction challenging. Furthermore, baseball-type activities require a wide range of skills, such as throwing, batting, and catching, and these skills tend to make individual differences highly visible (Matsuoka et al., 2000; Hirose et al., 2005; Nadamoto et al., 2017; Yamada & Tsuji, 2019). At the same time, baseball-type activities are characterized by intermittent participation, role specialization, and uneven distributions of movement opportunities during games. Such pedagogical and structural characteristics may influence how learners perceive the educational value and learning outcomes of baseball-type physical education. Taking these considerations into account, examining learning perspectives specific to baseball-type physical education is meaningful within the broader context of physical education research (Fukuda, 2026). Nevertheless, little is known about how preservice teachers perceive baseball-type physical education compared with physical education more broadly. In particular, previous studies have not sufficiently examined whether preservice teachers recognize baseball-type activities as having distinctive learning characteristics compared with other physical education activity types. Clarifying this issue is important because preservice teachers' learning perspectives may later influence how they understand, design, and implement instructional practices in physical education. Examining learning perspectives specific to baseball-type activities may therefore provide valuable insights into the relationship between prior learning experiences and future instructional beliefs.

Therefore, the present study aimed to clarify the learning perspectives of students enrolled in a health and physical education teacher training program regarding baseball-type physical education classes through a comparative analysis with their perspectives on general physical education classes.

## **METHOD**

### **Survey Period and Participants**

The survey was conducted on June 5, 2025. The participants were 70 first-year university students enrolled in the Health and Physical Education Teacher Training Program at University X. After excluding absentees and incomplete responses, 67 valid responses were obtained. Since the study targeted all students enrolled in the program during the survey period, a census sampling approach was adopted rather than statistical sampling. The sample size was considered appropriate for exploratory comparative analysis within a single teacher training cohort.

### **Survey Methods and Content**

A multiple-choice questionnaire survey was employed. The questionnaire was developed based on the "Physical Education Learning Perspective Scale" created by Ono et al. (2018), as shown in Table 1. The original scale consisted of five factors: "acquisition of motor skills," "development of communication skills," "acquisition of knowledge about the body and movement," "appreciation of the attractiveness of physical activity," and "improvement of physical fitness." In the present study, 22 items (No. 1–22) were used to assess learning perspectives on general physical education classes. In addition, the same 22 items were adapted to refer specifically to baseball-type physical education classes, resulting in another 22 items (No. 23–44). The adaptation process involved modifying the wording of the original items while maintaining the conceptual structure of each factor. To ensure content validity, the adapted items were reviewed by two researchers specializing in physical education pedagogy and teacher education. Items related to "acquisition of motor skills" assessed perceptions regarding improvement in movement skills and sport-specific techniques. "Development of communication skills" included items concerning cooperation and peer interaction during physical activity. "Acquisition of knowledge about the body and movement" focused on understanding movement principles and physical activity-related knowledge. "Appreciation of the attractiveness of physical activity" examined enjoyment and positive attitudes toward participation in physical activity. Finally, "improvement of physical fitness" assessed perceptions regarding endurance, strength, and overall physical fitness. Participants responded to all 44 items using a 4-point Likert scale ranging from "Strongly agree" (4 points) to "Strongly disagree" (1 point). A 4-point scale without a neutral option was adopted

to encourage participants to indicate a clear evaluative tendency regarding each item and to reduce central tendency bias. The questionnaire was administered during a lecture related to

**Table 1.** Contents of the Questionnaire Survey

No	Factors	Questionnaire
1	Acquisition of motor skills	In PE classes, I learn tactics for physical activities and sports.
2		In PE classes, I learn how to move my body effectively.
3		In PE classes, I learn tips for performing movements successfully.
4		In PE classes, I learn how to use various types of equipment in physical activities.
5		In PE classes, I learn different types of movements.
6	Development of communication skills	In PE classes, I learn the importance of understanding others.
7		In PE classes, I learn the importance of cooperating with others.
8		In PE classes, I learn appropriate attitudes when receiving instruction from others.
9		In PE classes, I learn how to manage emotional distance with others.
10		In PE classes, I learn how to give advice to others.
11	Acquisition of knowledge about the body and exercise	In PE classes, I learn manners related to physical activities and sports.
12		In PE classes, I learn about the origins of physical activities and sports.
13		In PE classes, I learn about the effects and impacts of physical activities and sports on the mind and body.
14		In PE classes, I learn the significance of physical activities and sports.
15		In PE classes, I learn the rules of physical activities and sports.
16	Appreciation of the attractiveness of physical activity	In PE classes, I experience the joy of being physically active.
17		In PE classes, I enjoy the excitement of competition.
18		In PE classes, I enjoy the pleasure of engaging in physical activity.
19	Improvement of physical abilities	In PE classes, I develop endurance.
20		In PE classes, I develop muscular strength.
21		In PE classes, I develop body flexibility.
22		In PE classes, I develop explosive power.
23	Acquisition of motor skills	In baseball-type classes, I learn tactics for physical activities and sports.
24		In baseball-type classes, I learn how to move my body effectively.
25		In baseball-type classes, I learn tips for performing movements successfully.
26		In baseball-type classes, I learn how to use various types of equipment in physical activities.
27		In baseball-type classes, I learn different types of movements.
28		In baseball-type classes, I learn the importance of understanding others.
29		In baseball-type classes, I learn the importance of cooperating with others.
30	Development of communication skills	In baseball-type classes, I learn appropriate attitudes when receiving instruction from others.
31		In baseball-type classes, I learn how to manage emotional distance with others.
32		In baseball-type classes, I learn how to give advice to others.
33		In baseball-type classes, I learn manners related to physical activities and sports.
34	Acquisition of knowledge about the body and exercise	In baseball-type classes, I learn about the origins of physical activities and sports.
35		In baseball-type classes, I learn about the effects and impacts of physical activities and sports on the mind and body.
36		In baseball-type classes, I learn the significance of physical activities and sports.
37		In baseball-type classes, I learn the rules of physical activities and sports.
38		Appreciation of the attractiveness of physical activity
39	In baseball-type classes, I enjoy the excitement of competition.	
40	In baseball-type classes, I enjoy the pleasure of engaging in physical activity.	

41		In baseball-type classes, I develop endurance.
42	Improvement of	In baseball-type classes, I develop muscular strength.
43	physical abilities	In baseball-type classes, I develop body flexibility.
44		In baseball-type classes, I develop explosive power.

teacher education. Students were informed about the purpose of the survey and provided informed consent before participation. Responses were submitted using participants' own smartphones via Microsoft Forms. The questionnaire required approximately five minutes to complete because the items consisted of brief evaluative statements with a fixed-response format. In addition, the survey was conducted in a supervised classroom setting to ensure that participants could respond carefully and without interruption.

### **Analysis Methods**

The data obtained from the questionnaire survey were scored on a four-point scale, and the mean (M) and standard deviation (SD) were calculated for each factor. To examine differences between perspectives on general physical education and baseball-type physical education classes, paired t-tests were conducted for each factor. In addition, effect sizes were calculated using Cohen's *d*. According to Cohen (1988), *d* values were interpreted as follows:  $d < 0.2$  = trivial,  $0.2 \leq d < 0.5$  = small,  $0.5 \leq d < 0.8$  = moderate, and  $d \geq 0.8$  = large. To examine the internal consistency of the adapted questionnaire, Cronbach's alpha coefficients were calculated for each factor. The alpha coefficients ranged from 0.78 to 0.91, indicating acceptable to high internal consistency. Statistical analyses were performed using JASP version 0.17.2.1, which has been validated for reliability (Shimizu & Yamamoto, 2022). The level of statistical significance was set at  $p < 0.05$ .

### **Ethical Considerations**

In conducting the questionnaire survey, the purpose of this study was explained to the target students in advance, and they were promised that the surveys and measurements involved in the study would have no bearing on their grades, and that the data obtained would not be used for any purpose other than the study. This study was conducted with the approval of the Research Ethics Committee of the Graduate School of Humanities and Social Sciences, Hiroshima University (Approval No.: HR-ES-003230).

### **RESULTS**

The results of the paired t-tests are presented in Table 2. Prior to conducting the analyses, the normality of the difference scores for each factor was examined using the Shapiro–Wilk test. The results indicated no substantial violations of normality assumptions, supporting the use of paired t-tests. Regarding students' perspectives on general physical education, the mean and standard deviation for each factor were as follows: "Acquisition of motor skills" ( $3.46 \pm 0.87$ ),

“Development of communication skills” ( $3.48 \pm 0.87$ ), “Acquisition of knowledge about the body and exercise” ( $3.54 \pm 0.86$ ), “Appreciation of the attractiveness of physical activity” ( $3.54 \pm 0.85$ ), and “Improvement of physical abilities” ( $3.43 \pm 0.89$ ). Regarding students’ perspectives on baseball-type physical education classes, the mean and standard deviation for each factor

**Table 2.** Analysis Results of T-Test (\*:  $p < 0.05$ )

	Learning perspectives on general physical education		Learning perspectives on baseball-type physical education classes		T-value	Effect sizes (d)
	M	SD	M	SD		
Acquisition of motor skills	3.46	0.87	3.48	0.87	0.75	0.09
Development of communication skills	3.48	0.87	3.51	0.86	1.37	0.17
Acquisition of knowledge about the body and exercise	3.54	0.86	3.50	0.88	1.31	0.16
Appreciation of the attractiveness of physical activity	3.54	0.85	3.54	0.89	0.17	0.02
Improvement of physical abilities	3.43	0.89	3.37	0.90	2.01*	0.25

were as follows: “Acquisition of motor skills” ( $3.48 \pm 0.87$ ), “Development of communication skills” ( $3.48 \pm 0.87$ ), “Acquisition of knowledge about the body and exercise” ( $3.54 \pm 0.86$ ), “Appreciation of the attractiveness of physical activity” ( $3.54 \pm 0.89$ ), and “Improvement of physical abilities” ( $3.37 \pm 0.90$ ). Paired t-tests revealed a significant difference only for “Improvement of physical abilities” ( $t = 2.01$ ,  $p = 0.049$ , 95% CI [0.00, 0.12],  $d = 0.25$ ). Although the difference reached statistical significance, the effect size was small, suggesting that the practical impact of this difference may be limited. No significant differences were found for the other four factors.

## DISCUSSION

The present study revealed that students’ learning perspectives regarding “improvement of physical abilities” were significantly lower for baseball-type physical education classes than for general physical education classes. This finding suggests that students tended to perceive baseball-type activities as contributing less to the development of physical fitness and physical capacities. However, because the observed effect size was small, the practical significance of this difference should be interpreted cautiously. One possible explanation for this finding lies in the structural characteristics of baseball-type physical education classes. Previous studies have consistently pointed out that baseball-type lessons often involve limited opportunities for

continuous physical activity and uneven participation in play (Takizawa & Iwata, 2004; Tsuchida & Fueki, 2007; Iwata, 2016). In addition, baseball-type activities require a variety of skills, including throwing, batting, and catching, and these skills often make individual skill differences highly visible (Matsuoka et al., 2000; Hirose et al., 2005; Nadamoto et al., 2017; Yamada & Tsuji, 2019). Such structural and skill-related characteristics may influence how students perceive the relationship between baseball-type physical education and physical fitness development. Matsushita (2000) also argued that securing sufficient opportunities for physical activity is one of the fundamental educational goals of physical education. From this perspective, students may perceive baseball-type physical education as less effective for physical fitness improvement when lessons provide limited opportunities for sustained movement. At the same time, the present study did not directly examine actual physical activity levels during baseball-type lessons. Therefore, the interpretation that lower evaluations were caused by reduced movement opportunities remains speculative. Alternative explanations should also be considered. For example, participants' prior experiences with baseball-type activities or their perceived competence in baseball-related skills may have influenced their learning perspectives. Omuro et al. (2021) pointed out that large skill gaps between experienced and inexperienced learners can make baseball-type instruction particularly challenging. Students with limited experience or lower confidence in baseball-related skills may therefore have perceived baseball-type physical education less positively in terms of physical development outcomes. Conversely, students with extensive baseball experience may have interpreted the educational value of baseball-type activities differently. Because the present study did not assess participants' prior sports experiences or skill levels, the influence of these factors cannot be ruled out. Another possible explanation is that students may associate "improvement of physical abilities" primarily with continuous movement activities such as running or endurance-based exercise rather than with tactical and intermittent activities like baseball-type games. In this sense, the lower evaluation of baseball-type physical education may reflect broader perceptions regarding the nature of physical fitness itself rather than the actual effectiveness of baseball-type lessons. Future studies should therefore examine how students conceptualize physical fitness and how these conceptions shape learning perspectives across different physical education activity types.

On the other hand, no significant differences were found between general physical education and baseball-type physical education classes in the domains of "acquisition of motor skills," "development of communication skills," "acquisition of knowledge about the body and exercise," and "appreciation of the attractiveness of physical activity." These findings suggest that students tended to perceive baseball-type physical education similarly to general physical education in most learning domains, despite the distinctive pedagogical characteristics of baseball-type activities (Fukuda, 2026). Previous studies have emphasized the educational

value of baseball-type activities in fostering communication and cooperation among learners. Akatsu et al. (2022) reported that teamwork and cooperative interaction can enhance learning outcomes in baseball-type classes, while Mori (2016) highlighted the importance of collaboration and tactical communication in these activities. However, despite these distinctive characteristics, the present findings suggest that preservice teachers may not yet clearly differentiate baseball-type physical education from physical education more broadly in terms of learning outcomes. Importantly, this does not necessarily indicate a lack of understanding. Rather, students may perceive communication, cooperation, and enjoyment as educational goals commonly shared across multiple forms of physical education. From the perspective of teacher education, these findings highlight the importance of helping preservice teachers develop a more differentiated understanding of activity-specific learning characteristics in physical education. Providing opportunities for lesson analysis, reflective discussion, and teaching practice focused on baseball-type activities may enable students to recognize how different activity structures influence learning experiences and instructional outcomes. Given that learning perspectives are not fixed and may change through teacher education experiences (Fukuda et al., 2025), future longitudinal studies should examine how preservice teachers' understandings of baseball-type physical education evolve throughout their professional preparation.

## **CONCLUSION**

This study aimed to clarify the characteristics of students' learning perspectives on baseball-type physical education classes by comparing them with their learning perspectives on general physical education. The participants were students enrolled in a teacher training program specializing in health and physical education. The analysis revealed that, compared to general physical education, students tended to perceive baseball-type classes as contributing less to the "improvement of physical abilities." Furthermore, although "development of communication skills" should be a particularly important aspect of baseball-type classes, no significant difference was found between the two types of learning perspectives. These findings suggest that the students may not have fully understood or recognized the specific characteristics and educational value of baseball-type physical education classes. Consequently, the results indicate the importance of fostering a multifaceted perspective on the educational significance of baseball-type classes within teacher training programs.

While these findings offer valuable insights, several limitations remain. Future research should involve longitudinal investigations to track how students' learning perspectives on baseball-type classes evolve throughout their teacher training. Additionally, examining the impact of

practical learning experiences, such as mock lessons and teaching practicum, on these beliefs would be beneficial in exploring more effective approaches to teacher education.

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