Journal of Foundational Learning and Child Development
Volume 02 Issue 03 (2026) | Doi. 10.53905/ChildDev.v2i03.16
Origina Research Articles

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RECEIVED: February 28, 2026
ACCEPTED: May 11, 2026
PUBLISHED: May 27, 2026

CITATION
Rizki, R., & Sari, M. (2026). Volleyball Learning Interest Among Adolescent Girls: A Multidimensional Profile of Attention, Enjoyment, Involvement, and Attraction. Journal of Foundational Learning and Child Development, 116-127. https://doi.org/10.53905/ChildDev.v2i03.16

Volleyball Learning Interest Among Adolescent Girls: A Multidimensional Profile of Attention, Enjoyment, Involvement, and Attraction

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ABSTRACT

Purpose of the study: Interest is an important motivational component of physical education (PE), influencing students' attention, enjoyment, and engagement in learning activities. However, interest in sport-specific learning may not be expressed uniformly across its affective, cognitive, and behavioural components, particularly among adolescent girls. This study aimed to describe the overall level of volleyball learning interest among Grade VII female students and examine the relative profile of four constituent indicators: feeling/enjoyment, attraction, attention, and involvement.

Materials and methods: A quantitative, non-experimental descriptive cross-sectional survey was conducted among 57 Grade VII female students at a public junior high school in Pekanbaru, Indonesia. Total population sampling was employed. Data were collected using a 33-item, four-point Likert-type questionnaire comprising feeling/enjoyment (7 items), attraction (8 items), attention (9 items), and involvement (9 items). Descriptive statistics, percentages of maximum ideal scores, frequency distributions, and 95% confidence intervals were calculated. Internal consistency was assessed using Cronbach's alpha.

Results: Overall volleyball learning interest was classified as strong, with a mean score of 90.86 ± 8.04 out of 132, equivalent to 68.83% of the maximum ideal score. Forty-eight students (84.21%) demonstrated strong or very strong interest. At the indicator level, attention showed the highest score (73.39%), followed by feeling/enjoyment (69.49%), involvement (67.84%), and attraction (64.25%). All four indicators were classified as strong. Attraction also demonstrated the greatest variability (SD = 4.24.

Conclusions: Grade VII female students demonstrated strong volleyball learning interest, but the profile was uneven across its constituent components. Attention and enjoyment were relatively stronger, whereas attraction was comparatively lower and more heterogeneous. These findings highlight the importance of strengthening the transition from classroom-based engagement toward more sustained and self-directed volleyball involvement.

Keywords
adolescent girls; volleyball learning; learning interest; physical education; attention; enjoyment; involvement; attraction.

INTRODUCTION

Global and Theoretical Context

Interest is a central motivational construct in learning because it influences learners' attention, affective engagement, and willingness to re-engage with learning activities over time (Authors, 2009, p. 90; Renninger & Hidi, 2011). Rather than representing a fixed personal characteristic, interest is conceptualised as a dynamic affective–cognitive state that can be stimulated and progressively developed through interactions between learners and their learning environments (Tan et al., 2024, p. 32212; Urhahne & Wijnia, 2023, p. 15). Reber et al. (2018, p. 450) four-phase model describes this development as a progression from triggered situational interest, through maintained situational interest, to emerging individual interest and, ultimately, well-developed individual interest. The distinction between situational and individual interest is particularly important in physical education (PE), where students may participate attentively and enjoy an activity during class without necessarily developing a sustained desire to engage in that activity independently (Chen, 2012, p. 3; Chen & Wang, 2017, p. 316).

Physical education provides an important context in which interest may contribute to students' continuing engagement with physical activity (Otundo & Garn, 2019, p. 141). Experiences of enjoyment, competence, and relatedness in PE are associated with more adaptive motivational outcomes and participation in physical activity. Evidence from the self-determination literature indicates that supportive instructional environments can facilitate students' motivation and engagement, suggesting that motivational responses in PE are responsive to pedagogical conditions rather than predetermined characteristics of learners (A. et al., 2026, p. 979; Sierra-Díaz et al., 2019, p. 2132).

However, maintaining students' interest becomes particularly challenging during early adolescence. Recent evidence indicates that motivation and enjoyment in PE tend to decline as students progress from primary to secondary education. This developmental transition coincides with the period in which students encounter increasing curricular demands, social changes, and potentially more differentiated

experiences of PE (Taylor et al., 2014; Weeldenburg et al., 2020, p. 1). Gender is also relevant. International research has reported lower intrinsic motivation and enjoyment among girls than boys, while qualitative evidence indicates that repeated negative or exclusionary experiences may contribute to disengagement from PE among girls over time (Avraam & Anagnostou, 2025; Chu et al., 2018, p. 234).

These findings do not imply that female students are inherently less interested in physical activity or sport. Rather, they highlight the importance of examining how interest is experienced and expressed within particular learning contexts (Chen & Wang, 2017, p. 320; Lobo & Dimalanta, 2024, p. 84). A student may demonstrate strong attention and enjoyment during a PE lesson while showing considerably less curiosity or intention to pursue the activity outside compulsory instruction (Otundo & Garn, 2019, p. 141). Consequently, measuring interest only as a global score may conceal meaningful differences between its affective, cognitive, and behavioural components.

Volleyball as a Sport-Specific Learning Context

Volleyball provides a particularly relevant context for examining these dimensions of interest. As a team sport included within Indonesian physical education, sport, and health (PJOK) instruction, volleyball offers opportunities to develop motor coordination, cooperation, communication, and social interaction (Alfaisal et al., 2024; Halim et al., 2019, p. 88). At the same time, the sport involves technically demanding skills—including serving, passing, attacking, and blocking—and is characterised by a fast-paced, net-separated playing environment (Kanatschnig et al., 2025, p. 2; Wang & Liang, 2023, p. 1288463). For beginning or less-experienced learners, these characteristics may influence their affective responses, attentional engagement, and willingness to participate.

Interest in volleyball learning therefore should not necessarily be regarded as a single undifferentiated construct. It can be expressed through feeling/enjoyment, reflecting affective pleasure and comfort during learning (Harackiewicz et al., 2016, p. 221; Urhahne & Wijnia, 2023, p. 14); attraction, reflecting curiosity and the desire to learn or pursue volleyball; attention, reflecting concentration on instruction, demonstrations, and corrective feedback; and involvement, reflecting active behavioural participation in learning activities (Awaluddin et al., 2025; Manalu et al., 2026, p. 853). These dimensions may develop at different rates and may not necessarily produce equivalent levels of engagement within the same group of students.

This distinction has practical significance for PE teachers. If students are attentive and enjoy volleyball lessons but show limited attraction toward continuing the activity beyond scheduled instruction, the appropriate pedagogical response may differ from a situation in which students are disengaged across all dimensions. Identifying the weakest component can therefore provide more actionable information than reporting a single overall interest score.

Critical Review of Existing Evidence

Two complementary research traditions provide the basis for understanding students' engagement in PE. The first is the international literature grounded in self-determination theory, which has examined the relationships among autonomy, competence, relatedness, motivation, enjoyment, and physical activity (A. et al., 2026, p. 974; Gråstén et al., 2019, p. 131). Large-scale and meta-analytic evidence indicates that need-supportive teaching is associated with more adaptive motivational outcomes and greater engagement in PE (Sevil-Serrano et al., 2020, p. 388). This literature provides strong theoretical and empirical foundations, but its outcomes are commonly operationalised as motivation, enjoyment, or physical activity rather than as sport-specific interest encompassing distinct attentional and behavioural components (Sahabuddin et al., 2025; Schmid et al., 2026, p. 2). Moreover, studies rarely isolate a single sport and seldom focus specifically on early-adolescent girls learning volleyball.

A second research tradition, particularly evident in Indonesian and Southeast Asian educational research, examines students' interest in specific curricular content using indicator-based questionnaires (Chen & Ennis, 2004, p. 334; Chen & Wang, 2017, p. 320). Within this tradition, interest has frequently been operationalised through dimensions such as feeling, attraction, attention, and involvement (Luo et al., 2019, p. 2302; Urhahne & Wijnia, 2023, p. 14). This approach has the advantage of being closely connected to teachers' curricular decisions and specific learning activities. Indonesian research has also demonstrated that students' interest in volleyball can vary substantially across cohorts (Alfathi et al., 2025; Fatubun et al., 2025).

Nevertheless, the existing sport-specific interest literature has several limitations. Studies differ in instrument length and scoring procedures, and reporting of validity, reliability, dispersion, and subgroup characteristics is inconsistent. In particular, many studies do not analyse girls separately, report only aggregate interest percentages, or provide limited information regarding variability among respondents. These methodological differences make direct comparison difficult and can obscure the internal structure of students' interest. The two research traditions consequently address different aspects of the problem: the self-determination literature is theoretically and inferentially strong but comparatively coarse regarding the component structure of sport-specific interest, whereas the indicator-based interest literature is curriculum-specific but often provides less comprehensive psychometric and statistical reporting.

Research Gap

Despite growing evidence that girls may experience lower motivation and enjoyment in PE and that engagement can become more fragile during early adolescence, an important question remains unresolved: how are the different components of interest distributed within a clearly defined population of early-adolescent girls learning a specific team sport?

In particular, it remains unclear whether female students who demonstrate interest in volleyball exhibit comparable levels of feeling/enjoyment, attraction, attention, and involvement, or whether one component represents a relatively weaker point in their engagement profile. This distinction is important because a strong aggregate interest score could conceal a meaningful reduction in one dimension that is educationally relevant—for example, a lower desire to pursue volleyball beyond compulsory classroom activities. Previous component-level surveys have frequently pooled genders, used partial samples, or omitted measures of dispersion, thereby limiting the ability to identify such internal differences. Accordingly, the present study addresses a more specific

question than whether students are simply "interested" in volleyball. It examines the internal profile of volleyball-learning interest among Grade VII female students, with particular attention to the relative strength of its four constituent indicators.

Novelty and International Contribution

The study contributes to the literature in three principal ways. First, it focuses specifically on early-adolescent female students, a population for whom PE engagement may become increasingly vulnerable during the transition to secondary schooling (Okely et al., 2017, p. 82; Verma et al., 2019, p. 22). Second, rather than relying on a convenience subsample, the study uses a complete enumeration of the accessible Grade VII female cohort, thereby providing a comprehensive description of the defined school population. Third, it reports an indicator-level profile together with measures of central tendency and dispersion, allowing differences between components of interest to be identified rather than concealed within a single aggregate score (Buerger et al., 2023, p. 623).

The study is also situated in Pekanbaru, Indonesia, providing evidence from a Global-South educational context that remains comparatively underrepresented in international research on gender and sport-specific PE engagement (Ridha et al., 2025, p. 295). Rather than attempting to generalise beyond the study setting, the contribution is to provide a detailed, contextually grounded profile that can generate hypotheses for comparative and longitudinal research.

The theoretical contribution lies in linking a component-based operationalisation of interest with the developmental perspective (Linnenbrink-Garcia et al., 2012, p. 610; Slot et al., 2018, p. 38). Specifically, stronger attention and enjoyment alongside comparatively weaker attraction may be descriptively consistent with interest that is effectively triggered and maintained within the classroom but has not yet developed into more enduring, self-directed individual interest (Knekta et al., 2020, p. 3). This interpretation is explicitly descriptive rather than developmental proof, because a cross-sectional design cannot establish progression between phases of interest.

Study Objective and Research Question

The primary objective of this study was to quantify the overall level of Grade VII female students' interest in volleyball learning at SMP Negeri 25 Pekanbaru, Indonesia. The secondary objective was to describe and compare the four constituent indicators of interest—feeling/enjoyment, attraction, attention, and involvement—to identify the strongest and weakest components. Because the study employed a descriptive cross-sectional design and did not conduct inferential hypothesis testing, the investigation was guided by the following research question: How strong is Grade VII female students' interest in volleyball learning, and how do feeling/enjoyment, attraction, attention, and involvement compare within the overall interest profile?

A theory-informed descriptive expectation was that attention and feeling/enjoyment would be relatively stronger than attraction, because the former are more directly associated with situational engagement during classroom learning, whereas attraction may reflect a more enduring desire to pursue volleyball beyond scheduled instruction. This expectation was evaluated descriptively rather than through statistical significance testing.

MATERIALS AND METHODS

Study Design and Reporting Framework

This study employed a quantitative, non-experimental, descriptive cross-sectional survey design to assess Grade VII female students' interest in volleyball learning. Data were collected at a single time point using a self-administered questionnaire. No intervention, experimental manipulation, comparator group, randomisation, or longitudinal follow-up was involved. The study was reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement for cross-sectional studies, consistent with the observational nature of the research.

Study Setting and Participants

The study was conducted at SMP Negeri 25 Pekanbaru, Pekanbaru, Riau Province, Indonesia, in January 2026, during the second semester of the 2025/2026 academic year. The target population comprised Grade VII female students participating in physical education (PJOK) classes. The accessible population consisted of all Grade VII female students enrolled in three parallel classes: VII-1, VII-2, and VII-3. The source manuscript defines this population as a complete enumeration of the accessible Grade VII female cohort rather than a convenience subsample. The population roster comprised 57 students, distributed as follows: Class VII-1: 21 students (36.84%); Class VII-2: 19 students (33.33%); Class VII-3: 17 students (29.82%). Thus, the final analysed sample consisted of 57 Grade VII female students (N = 57). All completed questionnaires were suitable for analysis, with no participant records excluded because of incomplete responses. This distribution is consistent with the participant information documented in the source manuscript.

Sampling and Sample Size

Because the accessible population was relatively small and clearly identifiable within the study setting, a total population sampling (census) approach was used. All Grade VII female students included in the population roster across the three classes were invited to participate. The census approach eliminated selection through subsampling within the school and allowed the study to describe the interest profile of the accessible population as comprehensively as possible. The final sample comprised 57 students: 21 from VII-1, 19 from VII-2, and 17 from VII-3. Accordingly, the sample analysed in this study represented the entire identified accessible population of Grade VII female students.

Research Instrument

Students' interest in volleyball learning was measured using a structured four-point Likert-type questionnaire adapted from the conceptual indicators reported by (Sulistyani & Sugianto, 2016). The instrument assessed four dimensions of learning interest: 1) Feeling/Enjoyment – students' affective pleasure, comfort, and positive feelings during volleyball learning; 2) Attraction – students' curiosity, desire, and willingness to engage with volleyball learning, including interest extending beyond scheduled lessons; 3) Attention – students'

concentration and attentiveness to explanations, demonstrations, instructions, and teacher feedback; and 4) Involvement – students' active behavioural participation in volleyball learning activities.

The final questionnaire comprised 33 items, distributed across the four indicators as follows: 7 items for feeling/enjoyment, 8 items for attraction, 9 items for attention, and 9 items for involvement. The instrument structure and indicator definitions follow the source study framework. Each item was rated using four response categories: Strongly Agree (SS), Agree (S), Disagree (TS), and Strongly Disagree (STS). Positively worded items were scored from 4 to 1, whereas negatively worded items were reverse-scored from 1 to 4. The four-point format was used to obtain a forced-choice response without a neutral midpoint.

Instrument Development and Item Screening

The questionnaire was initially developed with 50 items. Item screening was conducted during the instrument development stage, resulting in 33 retained items that met the specified item-total correlation criterion. The final item distribution consisted of 7 feeling/enjoyment items, 8 attraction items, 9 attention items, and 9 involvement items.

Importantly, item screening and internal consistency were treated as distinct psychometric procedures. The item screening process was used to determine which items were retained for the final questionnaire, whereas reliability analysis was subsequently conducted on the final 33-item instrument using the main study sample.

The original manuscript notes that the precise item-validity threshold and related psychometric documentation should be reported transparently rather than inferred.

Reliability Analysis

Internal consistency of the final questionnaire was assessed using Cronbach's alpha (α). Reliability was calculated using the responses of the 57 participants in the main study, rather than treating the main sample as pilot validation data.

Table 1. The resulting coefficients Reliability was calculated using the responses of the 57 participants in the main study

Interest indicator	Number of items	Cronbach's α
Feeling/Enjoyment	7	0.898
Attraction	8	0.991
Attention	9	0.908
Involvement	9	0.939
Overall scale	33	0.905

These coefficients indicate high internal consistency across the four indicator subscales and the overall 33-item instrument.

Data Collection Procedure

Data collection was conducted in January 2026 during scheduled physical education sessions. Following institutional permission, the questionnaire was administered in paper-based format to students in their respective classes.

Before completing the questionnaire, participants received standard written and verbal instructions concerning the purpose of the study, how to select responses, the requirement to respond to every item, and the importance of answering honestly according to their actual experiences in volleyball learning. Participants completed the questionnaire individually in approximately 15–20 minutes.

The classroom teacher was present during the administration primarily to facilitate classroom organisation and maintain an orderly setting. The teacher did not participate in students' responses and did not influence how students answered the questionnaire. Completed questionnaires were collected immediately after completion.

Data Preparation and Quality Control

Completed questionnaires were checked before statistical analysis. Each questionnaire was assigned a participant identifier, and responses were entered into the study dataset for analysis.

Data-quality screening indicated that the analysed dataset contained 57 participant records, with no missing item responses, no out-of-range responses, and no duplicate participant identifiers. These checks ensured that all 33 questionnaire items contributed to the computation of the indicator and overall scores.

Negative items were reverse-scored before the calculation of the corresponding indicator and overall scores. The scoring key was checked against the original questionnaire structure before final computation.

Outcome Measures and Scoring

The primary outcome was the overall level of students' interest in volleyball learning, while the secondary outcomes were the four constituent indicators: feeling/enjoyment, attraction, attention, and involvement.

For each participant, item scores were summed within each indicator. The maximum possible score was 28 for feeling/enjoyment, 32 for attraction, 36 for attention, and 36 for involvement, resulting in a maximum overall score of 132 points per participant.

The percentage of the maximum ideal score was calculated using:

Percentage of Maximum Ideal Score=

$$\left(\frac{ObservedScore}{(4 \times NumberofItems \times N)}\right) \times 100\%$$

Table 2. The resulting percentages were interpreted using five predefined categories

Percentage	Interpretation
81–100%	Very Strong
61–80%	Strong
41–60%	Moderate
21–40%	Weak
0–20%	Very Weak

This scoring framework follows the analytical procedure specified in the source manuscript.

Statistical Analysis

All statistical analyses were performed using IBM SPSS Statistics Version 28. The analysis was exclusively descriptive. Descriptive statistics included the minimum, maximum, mean, and standard deviation for the overall interest score and each of the four indicators. Frequencies and percentages were also calculated to describe the distribution of participants across the five interest categories. For the overall scale, the aggregate observed score was compared with the maximum ideal score. Indicator-level percentages were calculated to facilitate comparison among feeling/enjoyment, attraction, attention, and involvement.

A 95% confidence interval (CI) was calculated for the respondent-level mean scores to provide an estimate of the

precision of the observed mean. No hypothesis testing, p-values, effect sizes, subgroup comparisons, regression models, or other inferential analyses were performed because the study objective was descriptive rather than causal or comparative. This is consistent with the original analytical framework, which explicitly specifies descriptive analysis without inferential testing.

Ethical Considerations

The study was conducted in accordance with the ethical principles for research involving human participants set out in the Declaration of Helsinki. Research approval was obtained from the Research Institute of the Faculty of Teacher Training and Education, with reference number UIR/FKIP/R/26-4421, dated 18 January 2026. Before participation, students were informed about the purpose and procedures of the study, the voluntary nature of participation, the confidentiality and anonymity of their responses, and the assurance that their responses would not affect their academic grades. The source manuscript also recognises that, because the participants were minors, the consent/assent procedure should be explicitly documented.

RESULTS

Participants and Data Quality

The final dataset comprised 57 Grade VII female students from three parallel classes at the participating junior high school. Participants were distributed across VII-1 (*n* = 21, 36.84%), VII-2 (*n* = 19, 33.33%), and VII-3 (*n* = 17, 29.82%). All analysed participants were female students enrolled in Grade VII. The supplied dataset did not contain additional demographic information such as age, previous volleyball experience, or extracurricular participation. All 57 participant records contained complete responses to the 33 questionnaire items. Data-quality checks identified no missing item responses, out-of-range values, or duplicate participant identifiers. Accordingly, all 57 records were retained for the descriptive analyses. The participant distribution is presented in table 3.

Table 3. Participant characteristics and data completeness (N = 57)

Characteristic	Category	n	%
Sex	Female	57	100.00
Grade	VII	57	100.00
Class	VII-1	21	36.84
	VII-2	19	33.33
	VII-3	17	29.82

Note. Percentages for class represent the proportion of the total analysed sample. No missing questionnaire responses or out-of-range item values were detected.

Internal Consistency of the Interest Questionnaire

The internal consistency of the final 33-item questionnaire was examined using Cronbach's alpha. The overall scale demonstrated high internal consistency (α = .905). The four indicator domains also demonstrated high internal consistency, with coefficients ranging from .898 to .991: feeling/enjoyment (α = .898), attraction (α = .991), attention (α = .908), and involvement (α = .939). These results indicate a high degree of internal consistency among the items within each indicator in the present sample. The coefficients represent reliability estimates calculated from the main-study sample (*N* = 57). They should therefore be distinguished from the original pilot item-validation procedure, for which the pilot-level item data were not included in the supplied dataset.

Table 4. Internal consistency of the interest questionnaire

Indicator	Items (k)	N	Cronbach's α
Feeling/enjoyment	7	57	.898
Attraction	8	57	.991
Attention	9	57	.908
Involvement	9	57	.939
Overall scale	33	57	.905

Note. Cronbach's alpha was calculated using the main-study responses. The original pilot dataset was not available in the supplied workbook. Reverse-coded items should be verified against the original questionnaire scoring key before final submission.

Overall Interest in Volleyball Learning

Across the 57 participants, the total observed score for the 33-item interest questionnaire was 5,179 out of a maximum possible score of 7,524, corresponding to 68.83% of the maximum ideal score. The mean respondent-level overall score was 90.86 (*SD* = 8.04) out of a possible 132. The 95% confidence interval (CI) for the mean score was 88.73–92.99, equivalent to approximately 67.22–70.45% of the maximum possible score. According to the predefined classification criteria, the overall level of volleyball-learning interest was categorized as strong (61–80%). The respondent-level distribution showed that 44 students (77.19%) were classified as strong, four (7.02%) as very strong, and nine (15.79%) as moderate. No participant was classified as weak or very weak. Thus, 48 students (84.21%) were classified within the combined strong-to-very-strong range.

Table 5. Overall interest in volleyball learning (*N* = 57)

Measure	Value
Number of items	33
Maximum possible score	132
Total observed score	5,179
Mean score	90.86
SD	8.04
95% CI	88.73–92.99
Percentage of maximum ideal score	68.83%
Overall classification	Strong

Note. Classification bands were defined as very strong (81–100%), strong (61–80%), moderate (41–60%), weak (21–40%), and very weak (0–20%).

Indicator-Level Profile of Interest

The four indicators demonstrated a differentiated descriptive profile despite all remaining within the strong classification band. Attention recorded the highest percentage of the maximum ideal score (73.39%), followed by feeling/enjoyment (69.49%), involvement (67.84%), and attraction (64.25%). The mean attention score was 26.42 (*SD* = 3.21; 95% CI, 25.57–27.27) from a possible score of 36. Feeling/enjoyment had a mean score of 19.46 (*SD* = 2.58; 95% CI, 18.77–20.14) from a possible score of 28. The mean involvement score was 24.42 (*SD* = 3.48; 95% CI, 23.50–25.34) from a possible score of 36. Attraction had a mean score of 20.56 (*SD* = 4.24; 95% CI, 19.44–21.69) from a possible score of 32. Attraction showed the largest standard deviation (SD = 4.24), indicating greater respondent-level variability in attraction-related scores than in the other indicators. Feeling/enjoyment showed the smallest dispersion (SD = 2.58). The observed ranking—attention >

feeling/enjoyment > involvement > attraction—represents descriptive differences in magnitude only; no inferential test was performed to establish statistical significance between indicators.

Table 6. Indicator-level descriptive profile of interest in volleyball learning (*N* = 57)

Indicator	Items	Min	Max	Mean	SD	95% CI	% Ideal	Category
Attention	9	16	34	26.42	3.21	25.57–27.27	73.39	Strong
Feeling/enjoyment	7	15	25	19.46	2.58	18.77–20.14	69.49	Strong
Involvement	9	15	32	24.42	3.48	23.50–25.34	67.84	Strong
Attraction	8	12	29	20.56	4.24	19.44–21.69	64.25	Strong

Note. % Ideal = total observed score / maximum possible score × 100. The 95% CIs represent the respondent-level mean score for each indicator. All four indicators were classified as strong according to the predefined classification bands.

Distribution of Participants Across Interest Categories

The respondent-level classification was concentrated in the strong-interest category. Of the 57 participants, 44 (77.19%) were classified as strong, while 4 (7.02%) were classified as very strong. A further 9 participants (15.79%) were classified as moderate. No participants were classified as weak or very weak.

The distribution indicates that the observed sample was predominantly concentrated within the strong category, while a smaller subgroup demonstrated moderate interest.

Table 7. Distribution of participants by overall interest category (*N* = 57)

Interest category	n	%
Very strong (81–100%)	4	7.02
Strong (61–80%)	44	77.19
Moderate (41–60%)	9	15.79
Weak (21–40%)	0	0.00
Very weak (0–20%)	0	0.00
Total	57	100.00

Visual Profile of Interest Indicators

The indicator-level profile is visualised in Figure 1. Attention had the highest observed percentage of the maximum ideal score, whereas attraction had the lowest. Nevertheless, the point estimates for all four indicators remained above the 61% threshold corresponding to the strong classification band. The confidence intervals also illustrate the degree of uncertainty around the respondent-level mean estimates.

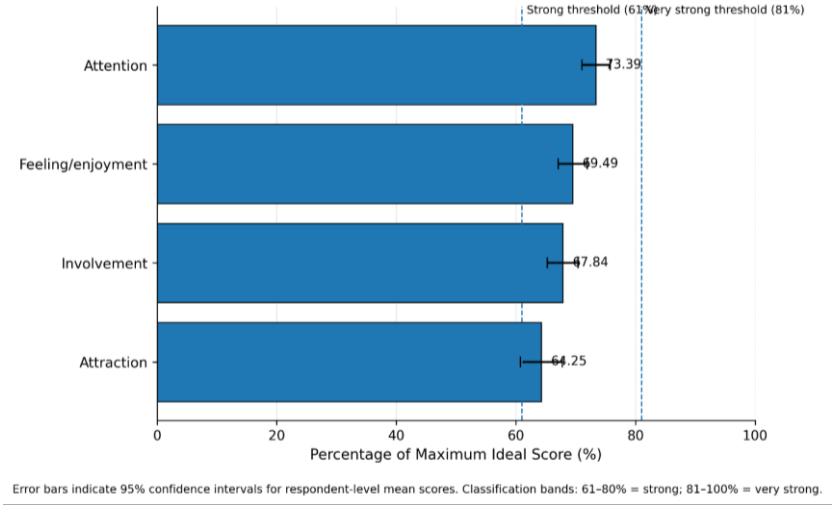

Figure 1. Indicator-Level Profile of Female Students' Interest in Volleyball Learning

Bars represent the percentage of the maximum ideal score for each interest indicator, with error bars representing 95% confidence intervals for respondent-level mean scores. Dashed reference lines indicate the 61% threshold for the strong category and the 81% threshold for the very strong category. The descriptive profile shows the highest score for attention (73.39%) and the lowest score for attraction (64.25%).

Integrated Results Statement

The overall findings indicate that interest in volleyball learning was strong among the 57 Grade VII female students, with an overall percentage-of-maximum-ideal score of 68.83%. At the indicator level, the profile was not uniform: attention was highest (73.39%), followed by feeling/enjoyment (69.49%), involvement (67.84%), and attraction (64.25%). All four indicators remained within the strong category. The relatively larger dispersion of attraction scores (*SD* = 4.24) compared with feeling/enjoyment (*SD* = 2.58) indicates greater heterogeneity in attraction-related responses. These findings provide a descriptive profile of the relative strengths and variability of different components of volleyball-learning interest within the study population.

DISCUSSION

Principal Findings

This study examined the overall level and component structure of Grade VII female students' interest in volleyball learning in a junior high school in Pekanbaru, Indonesia. Three

findings are particularly important. First, overall interest was classified as strong, reaching 68.83% of the maximum ideal score. Second, all four indicators—attention, feeling/enjoyment, involvement, and attraction—were independently classified within the strong category. Third, despite this generally positive profile, the indicators were not equally expressed: attention was the highest (73.39%), followed by feeling/enjoyment (69.49%), involvement (67.84%), and attraction (64.25%). At the respondent level, 84.21% of students were classified as either strong or very strong, while no student fell into the weak or very-weak categories.

The most important contribution of these findings is therefore not simply that female students demonstrated a strong interest in volleyball. Rather, the results reveal an uneven internal structure of interest. Students appeared to be most engaged in terms of paying attention during instruction and experiencing positive feelings during the lesson, whereas the comparatively lower attraction score suggests that the motivational strength associated with wanting to pursue volleyball may be less pronounced. This distinction would be obscured if interest were reported only as a single aggregate score. The indicator-level approach consequently provides a more informative description of where interest is strongest and where it may require further pedagogical support.(Chen & Ennis, 2004, p. 335; Chen & Wang, 2017, p. 320). The original rationale for the study similarly identified the need to move beyond aggregate interest scores toward a component-level understanding of girls' engagement with volleyball(Chen et al., 1999, p. 169; Chen & Wang, 2017, p. 317).

An important methodological qualification is that the differences among indicators should not be interpreted as statistically significant differences. The study was descriptive and did not conduct inferential tests. Thus, the rank order represents differences in observed descriptive magnitude rather than evidence that one component is statistically superior to another. Nevertheless, the consistency of the profile across the four indicators provides a meaningful descriptive signal for interpreting students' experiences of volleyball learning.

Interpreting the Attention–Enjoyment–Attraction Pattern

The highest score for attention (73.39%) suggests that students were relatively successful in directing their cognitive focus toward volleyball instruction. Attention encompasses concentration on explanations, demonstrations, instructions, and teacher feedback. Its position as the strongest indicator is particularly noteworthy because volleyball requires learners to coordinate multiple perceptual and technical demands, including following demonstrations, interpreting movement cues, and responding to rapidly changing play situations (Correia et al., 2018, p. 133; Lin et al., 2023, p. 4). The second-highest indicator, feeling/enjoyment (69.49%), further suggests that the learning environment was associated with generally positive affective experiences. Together, the relatively high attention and enjoyment scores indicate that volleyball lessons were capable of attracting students' immediate cognitive and affective engagement. This pattern is theoretically meaningful because interest is not simply an enduring preference for a topic; it can initially emerge through situationally supported attention and positive affect (Chen & Wang, 2017, p. 320; Makransky & Petersen, 2021, p. 944). The four-phase model of interest development proposed by Hidi and Renninger conceptualises interest as potentially progressing from triggered situational interest toward more sustained and individualised forms of interest (Reber et al., 2018, p. 450).

The present results are consistent with this theoretical interpretation. The combination of relatively high attention and enjoyment suggests that the classroom context itself may successfully trigger and maintain students' immediate interest in volleyball. However, this interpretation should remain appropriately cautious. Because the study was cross-sectional, it cannot establish that students are progressing through developmental phases of interest or that their situational interest will subsequently become individual interest(Otundo & Garn, 2019, p. 154; Park & Han, 2023, p. 13). Rather, the observed profile is consistent with a pattern in which situationally supported interest is more strongly expressed than self-directed attraction.

The comparatively lower attraction score (64.25%) is therefore the most theoretically informative finding. Attraction was still within the strong category, meaning that students were not uninterested in volleyball. However, it was the weakest of the four indicators and showed the largest dispersion (SD = 4.24), indicating greater variability among students in this component. Some students therefore appear to have had substantially stronger attraction toward volleyball than others, even though the group as a whole remained within the strong category.

This distinction is important. A student may listen attentively, enjoy a lesson, and participate actively without necessarily developing a strong desire to continue engaging with the sport outside compulsory instructional contexts. Thus, the present findings suggest that in-class engagement and longer-term attraction should not automatically be treated as equivalent constructs. The attraction indicator may represent a potentially important point at which situational engagement either develops into a more enduring personal interest or remains primarily dependent on the immediate learning environment(Kleespies et al., 2024, p. 796; Urhahne & Wijnia, 2023, p. 14).

Relationship to Previous International Evidence

The findings should be interpreted against a broader literature showing that motivation and enjoyment in physical education can decline during the transition into secondary education and that girls often report less favourable motivational experiences than boys. Previous international evidence has documented gender- and educational-stage differences in motivation, psychological-need satisfaction, and enjoyment in PE (Huhtiniemi et al., 2019; Soós et al., 2019, p. 523; Wang & Chen, 2021). At first glance, the strong interest observed among the female students in the present study might appear inconsistent with literature reporting lower motivation or enjoyment among girls. However, this is not necessarily a contradiction. Most of the international evidence cited in the manuscript compares girls with boys or students across educational stages, whereas the present study examines the internal profile of interest among girls within one specific sport and one instructional context(Lamb et al., 2018, p. 805; Zeng & He, 2024, p. 1387429). These are different analytical questions.

The present findings therefore provide a more nuanced interpretation: female students may experience relatively strong attention and enjoyment during a particular volleyball lesson even within a broader educational context in which girls, on

average, may experience lower PE motivation than boys (Gil-Arias et al., 2020; Manalu et al., 2026, p. 853). The contribution of the present study lies in identifying where interest remains comparatively strong and where it becomes less pronounced, rather than attempting to estimate a gender difference that the current design was not designed to test (Telford et al., 2016, p. 8).

The finding also complements qualitative research indicating that girls' experiences in PE can be shaped by perceived exclusion, inadequate support, or accumulated negative experiences over time. Such experiences may influence whether students continue to invest in physical activity beyond compulsory PE (Cairney et al., 2012, p. 32; Owen et al., 2017, p. 261). The present study cannot determine whether such mechanisms explain the lower attraction score because variables such as prior volleyball experience, perceived competence, social support, and access to facilities were not measured(Beets et al., 2016, p. 128; McIntyre et al., 2017, p. 1454). Nevertheless, the coexistence of relatively strong classroom attention and enjoyment with weaker attraction provides a useful basis for future investigation of how classroom experiences are translated—or fail to be translated—into more enduring engagement.

The findings also contribute to the Indonesian literature on volleyball interest. Previous Indonesian research has reported variation in students' interest in volleyball, including moderate or lower levels in some populations (Abdurrohman et al., 2021, p. 1; Hidayah & Asim, 2022). Direct numerical comparisons should, however, be made cautiously because studies differ in population composition, sampling strategy, questionnaire structure, scoring procedures, and local instructional conditions. The present study specifically examined a single-sex Grade VII population using a complete enumeration and reported four separate interest indicators rather than only an aggregate score (Blotnicky et al., 2018, p. 34; Höffler et al., 2019, p. 3).

Theoretical Implications

Theoretically, the findings support the value of conceptualising interest as a multidimensional and potentially developmental construct, rather than as a single undifferentiated motivational score. The overall classification of "strong" is useful but insufficient to explain the internal organisation of students' interest. In this study, an aggregate score of 68.83% concealed a meaningful gradient across the four indicators, with a difference of approximately 9 percentage points between the highest and lowest components.

This componential pattern is particularly relevant to the four-phase model of interest development. The relatively high attention and enjoyment scores are compatible with triggered or maintained situational interest, whereas the lower attraction score may indicate that the students' interest is not equally strong in the dimension associated with more self-directed pursuit (Kleespies et al., 2024, p. 805; Urhahne & Wijnia, 2023, p. 14). However, the cross-sectional nature of the evidence means that the study cannot demonstrate a developmental transition from situational to individual interest (Linnenbrink-Garcia et al., 2012, p. 596; Tatiana et al., 2023, p. 15). The appropriate interpretation is therefore that the observed profile resembles or is consistent with this theoretical trajectory rather than empirically establishing it.

This distinction strengthens rather than weakens the theoretical contribution. Instead of claiming that the students have definitively reached a particular phase of interest development, the study identifies an empirically observable pattern that can be tested longitudinally (Harackiewicz et al., 2016, p. 222; Urhahne & Wijnia, 2023, p. 14). Future research can determine whether students with strong attention and enjoyment subsequently develop stronger attraction and sustained participation, or whether these forms of interest remain dependent on classroom exposure.

Practical Implications for Volleyball Teaching

The practical implication is not that teachers need to create basic classroom engagement from the beginning; the present results suggest that attention and enjoyment are already relatively strong. The more relevant pedagogical challenge is to create opportunities through which positive classroom experiences can be extended into more self-directed forms of engagement.

Several strategies may be particularly relevant. First, teachers could provide autonomy-supportive choices, allowing students some control over practice tasks, roles, difficulty levels, or small-sided game formats. Second, volleyball activities can be progressively modified to ensure that students experience attainable success, particularly when technical skills such as serving, passing, and attacking initially create barriers to competence. Third, teachers could provide structured opportunities for peer-based challenges, informal play, volleyball clubs, or extracurricular activities that connect classroom learning with voluntary participation outside scheduled lessons. Fourth, individualised and constructive feedback may help students associate volleyball with competence and personal improvement rather than simply with task completion.

These recommendations are consistent with evidence emphasising the importance of autonomy-supportive teaching for adaptive motivation in PE. Importantly, however, the current study does not demonstrate that these strategies will increase attraction. They should therefore be regarded as pedagogically plausible strategies requiring evaluation through intervention or longitudinal research rather than as causal prescriptions.

The relatively large dispersion of the attraction indicator provides an additional practical reason to avoid a one-size-fits-all approach. With an SD of 4.24, students differed more substantially in attraction than in attention. Teachers may therefore need to identify students who are attentive and cooperative during lessons but show limited voluntary interest in continuing volleyball beyond the classroom. Such students may benefit from low-pressure opportunities that emphasise enjoyment, competence, choice, and peer connection rather than competitive performance alone.

Strengths and Limitations

Several strengths increase the descriptive value of this study. First, the research focused specifically on female students during early adolescence, a developmental period in which PE engagement may become more vulnerable. Second, the study used a complete enumeration of the accessible Grade VII female cohort, thereby avoiding within-school selection through convenience sampling. Third, the study reported not only the overall percentage but also the four-indicator profile and corresponding score dispersion, allowing the weakest component to be identified. Fourth, internal consistency was assessed for the final 33-item scale and each

indicator, strengthening the transparency of the measurement procedure.

Several limitations nevertheless constrain interpretation. Most importantly, the study was conducted in one public junior high school with 57 female students. Although the census approach provides comprehensive coverage of the accessible population, it does not make the findings statistically generalisable to female students in other schools, regions, or educational systems. The study should therefore be understood primarily as a population-specific descriptive investigation and as a basis for hypothesis generation. Second, the cross-sectional design provides a snapshot rather than evidence of developmental change. Consequently, the interpretation of the attention–enjoyment–attraction pattern through interest-development theory remains theoretically informed but cannot establish a developmental sequence. Longitudinal research is required to determine whether strong situational engagement actually develops into enduring individual interest. Third, interest was assessed through self-report, which may be affected by social desirability, acquiescence, or students' interpretation of questionnaire items. The confidential administration and four-point response format may reduce some of these concerns, but they cannot eliminate them entirely. Fourth, potentially relevant explanatory variables—including age variation, previous volleyball experience, access to facilities, perceived competence, and extracurricular participation—were not collected. Consequently, the study cannot determine why attraction varied more strongly among students or whether differences in experience or opportunity contributed to the observed profile. Finally, because the study included only female students, it cannot directly quantify a gender difference in volleyball interest. References to the broader literature on girls' and boys' motivation should therefore be understood as contextual interpretation rather than evidence of a gender gap within the present sample.

Implications for Future Research

The present findings generate several directions for future research. First, studies should replicate the four-indicator assessment across multiple schools and regions to determine whether the attention-high/attraction-low pattern is reproducible beyond the present setting. Larger samples would also permit inferential analyses and examination of potential moderators. Second, future research should incorporate more comprehensive psychometric evaluation, including confirmatory factor analysis of the four-indicator structure and, where appropriate, alternative internal-consistency estimates such as McDonald's omega. This would provide stronger evidence that feeling/enjoyment, attraction, attention, and involvement represent empirically distinguishable dimensions of volleyball learning interest. Third, longitudinal studies following students across Grades VII–IX could directly examine whether attention and enjoyment are sustained and whether attraction increases as students gain competence and positive experiences. Such research would provide a stronger empirical test of the proposed transition from situational to more enduring interest. Fourth, comparative research involving male and female students would allow gender differences to be estimated directly rather than inferred from external literature. Such studies could examine whether the relative ordering of attention, enjoyment, involvement, and attraction differs by gender. Finally, intervention studies should test whether autonomy-supportive instruction, modified volleyball tasks, competence-oriented feedback, peer activities, and structured opportunities for out-of-class participation can strengthen the attraction component specifically. Randomised or quasi-experimental designs would be particularly useful for determining whether these pedagogical strategies produce measurable changes in sustained interest.

Overall Interpretation

Taken together, the findings indicate that Grade VII female students in the present school context were generally interested in learning volleyball, but their interest was not uniformly expressed across its components. The strongest evidence concerned attention and enjoyment within the PE lesson, whereas attraction the indicator most closely associated with willingness to pursue volleyball beyond scheduled instruction was comparatively lower and more heterogeneous. The most defensible interpretation is therefore that students demonstrated strong classroom-based interest with a comparatively less developed tendency toward self-directed pursuit. This profile is consistent with the theoretical distinction between situationally triggered interest and more enduring individual interest, but the present cross-sectional data cannot establish that developmental transition. The principal contribution of the study is consequently the identification of the internal structure of female students' volleyball-learning interest, rather than a causal explanation of why that structure occurs. This distinction is essential for interpreting the findings appropriately and for designing the longitudinal and intervention research needed to establish mechanisms and developmental change.

CONCLUSION

This study demonstrated that Grade VII female students at SMP Negeri 25 Pekanbaru had a strong overall interest in volleyball learning, with an overall score of 68.83% of the maximum ideal score. The respondent-level distribution further showed that 48 of 57 students (84.21%) were classified as having strong or very strong interest, while no students were classified within the weak or very-weak categories.

Although overall interest was strong, the findings revealed a distinct internal gradient across the four indicators. Attention represented the strongest component (73.39%), followed by feeling/enjoyment (69.49%), involvement (67.84%), and attraction (64.25%). Thus, students appeared to demonstrate relatively strong cognitive and affective engagement during volleyball lessons, whereas attraction—the component reflecting curiosity and willingness to pursue volleyball more independently—was comparatively lower and showed the greatest variability among students.

The principal contribution of this study is therefore the identification of an indicator-level profile of female students' interest, rather than merely establishing that their overall interest was strong. The findings suggest that positive classroom engagement does not necessarily imply an equally strong tendency toward continued, self-directed engagement beyond the scheduled PE lesson. Interpreted through the four-

phase model of interest development, this pattern is consistent with a predominance of situationally supported interest, particularly in attention and enjoyment, while attraction may represent an important area for further development. However, because the present study used a descriptive cross-sectional design, this interpretation should not be understood as evidence of a demonstrated developmental transition from situational to individual interest.

From a pedagogical perspective, the findings indicate that volleyball instruction for early-adolescent girls should not focus exclusively on generating immediate classroom engagement, which was already relatively strong in this population. Instead, instructional strategies may be directed toward bridging classroom interest with voluntary and sustained engagement, for example through autonomy-supportive choices, appropriately challenging tasks, competence-building activities, peer interaction, and opportunities for volleyball participation beyond scheduled lessons. These strategies should be empirically evaluated rather than assumed to produce causal improvements in attraction.

Given the single-school, female-only, cross-sectional design, the conclusions are population-specific and hypothesis-generating rather than broadly generalisable or causal. Future multi-school and longitudinal studies should determine whether the attention–enjoyment–involvement–attraction pattern is reproducible across contexts and whether targeted pedagogical interventions can strengthen the transition from classroom-based interest toward more sustained individual engagement.

In conclusion, female students' interest in volleyball learning was strong but unevenly distributed across its constituent components. The key educational implication is not simply to increase interest, but to strengthen the pathway from strong in-class attention and enjoyment toward more enduring and self-directed engagement with volleyball.

DECLARATIONS

Ethical Approval

The study was conducted in accordance with the principles of the Declaration of Helsinki. Institutional permission for data collection was obtained from SMP Negeri 25 Pekanbaru. Research approval was also obtained from the Lembaga Riset Penelitian FKIP, Universitas Islam Riau, under reference number UIR/FKIP/R/26-4421, dated 18 January 2026. Participation was voluntary, and the study procedures included appropriate assurances regarding confidentiality, anonymity, and the non-impact of participation on students' academic grades. Because the participants were minors, the authors should ensure that the final manuscript accurately reports the documented parental/guardian consent and student assent procedures, if applicable.

Author Contributions (CRediT):

R. Rizki: Conceptualization; Methodology; Investigation; Formal analysis; Writing—original draft; Project administration.
M. Sari: Conceptualization; Methodology; Writing—review and editing; Supervision.
All authors: Read and approved the final version of the manuscript and agreed to be accountable for all aspects of the work.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors

Conflict of Interest

The authors declare no conflict of interest.

Acknowledgements

The authors would like to thank the principal, physical education (PJOK) teachers, and Grade VII students of SMP Negeri 25 Pekanbaru for their cooperation and support during the research process.

Generative AI Disclosure

Generative AI tools were used solely to assist with language refinement, manuscript structuring, and editorial improvement during the preparation of this manuscript. No confidential, identifiable, or participant-level data were entered into any generative AI system. The authors critically reviewed, verified, and revised all AI-assisted content and take full responsibility for the accuracy, integrity, interpretation, and final version of the manuscript. Generative AI was not used to generate, manipulate, or fabricate the study data, statistical results, or research findings.

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