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Exploring the relationship between kinetic intelligence and the cultivation of students' interest in sports in vocational school physical education: A case study of College Y

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ABSTRACT

This study aims to explore effective strategies for cultivating students' interest in physical education within vocational schools, focusing on non-sports major students at College Y. The study involved 500 vocational students aged 16 to 22 years, employing a variety of methods, including literature analysis, questionnaire surveys, empirical measurements, and mathematical statistics. A comprehensive analysis was conducted on students' attitudes towards physical exercise, motor quotient, and interest in physical education learning. The findings reveal that creative teaching methods, increasing the diversity and practicality of physical activities, and optimizing the structure of physical education courses can significantly enhance students' interest in learning sports. Additionally, good school sports facilities and a positive sports atmosphere are crucial for stimulating students' interest in sports. This study emphasizes that cultivating students' interest in sports requires joint efforts from schools, teachers, and policymakers to achieve sustained development of students' sports interests and the educational goals of a healthy China.

Keywords: Physical education, sports interest, educational strategies.

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INTRODUCTION

Since the introduction of the "Opinions on Strengthening Youth Sports and Enhancing Youth Physical Fitness" in 2007, the Chinese government has been continuously advancing sports education reforms, emphasizing the selection of appropriate teaching activities based on students' characteristics, as well as cultivating an interest in sports and exercise habits. The "Physical Education and Health Curriculum Standards" (2011), the "National Fitness Plan (2016-2020)," and the "Notice on the Construction of a Strong Sports Nation" (2019) further clarify the goals of enhancing physical fitness, promoting sports culture, and fostering the awareness of lifelong exercise.

In international research, Gardner's Theory of Multiple Intelligences provides theoretical support for studying Motor Quotient (MQ), suggesting that bodily-kinesthetic intelligence can enhance motor skills and physical fitness. However, limited research combines this with students' interest in physical education, particularly in vocational school populations, where such studies are still sparse. Domestic scholars, such as Wang Zongping (2014) and Li Jinghai (2015), have also noted the significant role of physical exercise and sports interest in the development of MQ. However, most existing research has focused on

regular higher education institutions.

Therefore, this study focuses on vocational school students, exploring the relationship between MQ and sports interest to fill the research gap, systematically assessing students' MQ levels, analyzing the correlation between the two, and providing scientific evidence and strategic recommendations for physical education in vocational schools.

LITERATURE REVIEW

The theoretical foundation of this study is primarily based on Gardner's Theory of Multiple Intelligences, Interest Theory, and the Theory of Holistic Development. The following review outlines the relationship between these theories and the topic of this study in light of relevant research findings.

Gardner's (1983) Theory of Multiple Intelligences emphasizes the diversity of human intelligence, whereas Bodily-Kinesthetic Intelligence refers to the ability to solve problems or create products through physical movements. This theory expands the concept of traditional intelligence and provides an important perspective for physical education. Research indicates that developing kinesthetic intelligence helps improve students' motor skills, physical coordination, and self-confidence (Armstrong, 2009). In educational practice, the design of diverse teaching methods, such as movement imitation and sports games, can effectively stimulate students' interest and engagement in learning (Chen and Darst, 2001). Domestic studies also show that kinesthetic intelligence plays an important role in students' social adaptation and personal development, especially in vocational education, where greater emphasis is placed on promoting the development of kinesthetic intelligence through practical activities (Xiaoying et al, 2023).

Hidi and Renninger's (2006) Interest Theory divides interest development into four stages: triggering situational interest, maintaining situational interest, early personal interest, and later personal interest. Research indicates that novel content and challenging designs in physical education can trigger students' interest, while teamwork and positive feedback are key factors in maintaining interest (Merino-Campos, 2025). Long-term interest development requires a combination of external support and internal emotional identification. Further domestic research confirms that cultivating students' interest in physical education enhances participation and improves their motor skills and health levels (Li Jinghai, 2015). The development of vocational school students' sports interests is particularly distinctive due to strong practical demands, and this study, based on Interest Theory, analyzes the dynamic mechanism of students' interest development and its relationship with MQ, providing a basis for improving physical education in vocational schools (Thepa, 2024).

Marx's Theory of Holistic Development emphasizes individuals' balanced intellectual, physical, mental, and moral development (Anyanwu, Ononiwu and Isiozor, 2024). As an important component of comprehensive ability, MQ, together with IQ and EQ, forms the "three quotients," playing a key role in holistic development (Wang Zongping, 2014). Research shows that improving MQ enhances students' physical fitness and promotes their social interaction skills and practical abilities. In vocational education, students often need to improve their skills through hands-on practice and sports experience, making the development of MQ particularly important (Chen and Anyanwu, 2025).

Internationally, research on kinesthetic intelligence and sports interest has primarily focused on regular school students, emphasizing the impact of kinesthetic intelligence on motor ability and participation (Gardner, 1985; Hidi and Renninger, 2006). In China, scholars have gradually paid attention to the relationship between MQ and sports interest, as Wang Zongping (2014) pointed out that a good interest in physical education can significantly promote the development of MQ. Although existing research has provided theoretical support for the relationship between MQ and interest, studies have mostly focused on regular university students, with less exploration of the vocational school student group. In the existing literature, vocational school students' specific needs and interest development (such as strong hands-on abilities and high practical demands) in physical education have not been systematically studied.

By integrating the Theory of Multiple Intelligences, Interest Theory, and the Theory of Holistic Development, although existing research has explored the relationship between MQ, sports interest, and motor skills, systematic studies in vocational school student populations are still lacking. In response to this research gap, this study aims to assess the MQ levels of vocational school students, analyze the correlation between MQ and sports interest, and provide scientific evidence and practical strategies for improving physical education in vocational schools.

In conclusion, this study is of significant theoretical and practical importance. It will further enrich the theoretical physical education system and promote vocational school physical education reforms, guiding cultivating students' comprehensive abilities and healthy lifestyles.

Research on motor quotient (MQ) measurement tools in China

The measurement of Motor Quotient (MQ) in China started relatively late and is still in its early stages, with relevant research ongoing. According to Wang Zongping and Zhang Yi (2014), the measurement of Motor Quotient (MQ) should include three indicators: physical fitness, motor

functions, and sports psychology. The methods of measurement include laboratory measurements, field measurements, and questionnaires. Laboratory measurements involve heart function indexes and body composition. Field measurements include the 3000-meter run, 100-meter sprint, pull-ups, and standing long jump. Questionnaires focus on aspects like exercise willingness, willpower, and habits. Liu Dabin et al. (2016) researched specific indicators within physical fitness, suggesting the inclusion of strength, speed, endurance, flexibility, and agility, and proposed the measurement criteria for each.

Furthermore, the calculation formula for Motor Quotient (MQ) is the sum of the values of each indicator divided by the number of indicators. This provides a scientific basis for quantifying Motor Quotient (MQ) and has driven the development of this field. The formula for calculating Motor Quotient (MQ) is:

$$MQ_A = (MQ_{A1} + MQ_{A2} + MQ_{A3} + \cdots + MQ_{An}) \quad (1)$$

$$MQ_{A1} = [N - (X - 1)] / N \quad (2)$$

MQ_A represents the sports quotient score obtained by individual A, where MQ_{A1}, MQ_{A2}, indicate the scores obtained in specific items by the individual. N represents the total number of tests, and X denotes the individual's ranking in a particular test item. Zhu Dapeng and Chen Wei (2017) believe that measuring sports quotients should be more rigorous and should consider multiple aspects. It should focus on the outcomes of the tests and process indicators, which are extremely important. Factors such as the individual's attitude and motivation towards learning should also be considered. Environmental factors like temperature, wind direction, and geographical region during the tests should also be considered when measuring the sports quotient.

In children's sports quotient (SQ) measurement, Zhang et al. (2016) developed a comprehensive SQ evaluation system for children aged 5 to 6 using scientific methods. This system constructs measurement indicators from four aspects: physical quality, body function, sports psychology, and sports intelligence. Specifically, the assignment of scores for physical quality and body function is conducted through deviation analysis. At the same time, sports intelligence and sports psychology are assessed using questionnaires, with values assigned to questionnaire options. The formula for calculating SQ is defined as MQ = 100 + 15Z, where Z is the standard score, calculated as $Z = \frac{X - \chi}{S}$ X is the individual's measured score, χ the sample mean, and S is the standard deviation.

Furthermore, Zhang Hongbing and Wang Zongping jointly constructed an SQ evaluation system for children aged 7-12. This system's indicators and construction methods were scientifically validated through tests on large-scale samples. Jiang Lei (2016), in his master's thesis, further expanded the SQ evaluation system for 5-6-year-old children, dividing the tests into subjective evaluations and objective measurements. Subjective evaluations include psychological questionnaires, school questionnaires, and family questionnaires. At the same time, objective measurements cover three main categories: body morphology, physical quality, and sports potential, which are further divided into six secondary dimensions comprising 83 specific indicators. This method not only established a complete calculation system but also provided a detailed validation of the practical application of the system. These studies offer a scientific methodology and empirical basis for assessing children's SQ.

In adolescent sports quotient (SQ) measurement tools, Chang Jindong proposed a theoretical model for measuring adolescent SQ, outlining the calculation methods for "kinetic energy, kinesthetic sense, kinetic desire, and somatic ability." He provided a formula for calculating SQ, where kinetic energy, kinesthetic sense, and kinetic desire are each multiplied by their respective weights, summed, and then divided by the somatic ability to derive the SQ value. Chang Jindong outlined the measurement method for SQ, clearly considering SQ as a quotient concept. However, it is unfortunate that Chang Jindong did not specify the concrete indicators for adolescent SQ measurement. Chang Jindong's proposed formula for calculating SQ is:

$$IMCI_i = \sum_{i=1}^{n} (K_c MC_i + K_s MS_i + K_d MD_i) / \sum_{i=1}^{n} BF_i \quad (1)$$

$$\sum_{i=1}^{n} MC_i = \sum_{i=1}^{n} (K_1 c_i + K_2 c_i + \cdots + K_n c_i) \quad (2)$$

$$\sum_{i=1}^{n} MC_i = \sum_{i=1}^{n} (K_1 s_i + K_2 s_i + \cdots + K_n s_i) \quad (3)$$

$$\sum_{i=1}^{n} MD_i = \sum_{i=1}^{n} (K_1 d_i + K_2 d_i + \cdots + K_n d_i) \quad (4)$$

$$\sum_{i=1}^{n} BF_i = \sum_{i=1}^{n} (K_1 f_i + K_2 f_i + \cdots + K_n f_i) \quad (5)$$

In formula (1), IMCI represents the Sports Quotient (MQ) score, where i represents the i th individual, n represents the number of subtests, and k_c, k_s, k_d correspond to the weights for MC, MS, and MD, respectively. MC, MS, MD, and BF each correspond to the subtest scores for "kinetic energy, kinesthetic sense, kinetic desire, and somatic ability," respectively. Formulas (2), (3), (4), and (5) are the scoring models for MC, MS, MD, and BF, respectively, where i represents the i th individual, n represents the

number of test items in each formula, k represents the weights for the test items, and c, s, d, f represent the specific test items of each subtest. Chang Jindong (2021) developed the assessment indicators for the SQ of children aged 6-9 in his doctoral dissertation. He constructed indicators from three aspects: kinetic energy quotient, kinesthetic skill quotient, and kinetic mind quotient, calculating the individual's SQ based on the respective weights of these three indicators (Singh, 2024).

In sports quotient (SQ) measurement among college students, Cui (2018) proposed a set of evaluation indicators for college students' SQ, choosing group rope skipping as the primary test item and assessing students' SQ levels by calculating the success rate. Additionally, Cui correlated and conducted regression analyses between the calculated SQ and students' physical fitness test scores, academic performance, and sports psychological function scores. The analysis showed that the proposed SQ measurement indicators fit within an acceptable range. Wang Cheng (2020) further developed the SQ assessment system for college students, dividing it into three dimensions: 1) Basic Qualities: covering the conventional physical fitness test content for college students; 2) Athletic Qualities: including tests such as 30-second rope skipping, cross quadrant jumping, slalom running, shot put, step test, and plank hold; 3) Athletic Will: assessed through a questionnaire containing 20 questions related to sports psychology. Wang Cheng also provided a method for assigning values to the measurement indicators and formulated a calculation formula for SQ. The efficacy of this system was validated through random sampling tests of college students from ten universities. This research provides a scientific basis for assessing and enhancing college students' SQ and promotes a deeper understanding of this field within the academic community. Sports Quotient Formula:

In the formula, MQ represents the Sports Quotient value, T_i represents the score for the i th indicator of athletic ability, and P_i represents the weight corresponding to this indicator; T_r represents the score for the rth indicator of basic qualities and P_r represents the weight corresponding to this indicator. According to the secondary indicators set by researchers, the tertiary indicators are weighted and summed. This sum is then divided by the weighted sum of the secondary indicators to derive the final evaluated target Sports Quotient value.

METHODOLOGY

This study adopts a quantitative research method to explore the relationship between college students' Motor Quotient (MQ), attitude toward physical exercise, and sports learning interest, as well as to analyze the factors influencing students' sports interest and potential improvement strategies. The choice of a quantitative research method aims to reveal the relationships between variables through systematic questionnaire surveys and data analysis to provide statistically significant conclusions.

Quantitative research emphasizes hypothesis testing through structured data collection and statistical analysis. The research design is guided by theory and integrates literature review and data analysis to ensure the scientific rigor of the study. This study collects comprehensive quantitative data through questionnaire surveys and physical fitness measurements and conducts mathematical and statistical analyses to draw research conclusions. To achieve the research objectives, the researcher has formulated the following research questions:

1. What is the relationship between kinesthetic intelligence and students' interest in participating in physical activities in physical education courses?
2. What factors influence students' interest in school sports?
3. What strategies can enhance students' interest in physical education?

Participants

The research subjects are selected from non-physical education major students in their first to fourth year at Y College, with 500 participants randomly chosen from each grade level. The testing is scheduled to be carried out between September and November 2024. To ensure data quality and reliability, the inclusion criteria specify that participants must be in good psychological condition, free from serious illnesses, and not under the influence of alcohol or fasting on the day of the test to ensure they can complete all tests effectively. The exclusion criteria are clearly defined: students who fail to complete all the test items or submit invalid questionnaires will be excluded from the final data analysis, ensuring the accuracy and scientific rigor of the research findings.

Data collection

The data collection process in this study employed various methods and tools, aiming to comprehensively gather relevant information on the Motor Quotient (MQ), attitudes toward physical exercise, and sports learning interests of college students. A questionnaire survey was conducted

among students majoring in non-physical education from the first to the fourth year at Y College. The questionnaire consisted of two parts: the first part covered demographic information, including gender, age, and place of origin; the second part contained professional measurement tools, such as a sports psychology questionnaire, physical activity level scale, and a sports learning interest scale, which were used to collect quantitative data on students' attitudes toward physical exercise and learning interest. The questionnaires were distributed online and offline, with 500 distributed and 458 valid responses collected, resulting in a valid response rate of 91.6%.

To further validate the effectiveness of the questionnaire data, the research team conducted physical fitness tests on the students who completed the questionnaires. The tests measured seven indicators: strength, speed, endurance, flexibility, agility, body mass index, and vital capacity. These testing indicators were based on the Motor Quotient (MQ) evaluation system proposed by Professor Wang Zongping, with the research team participating in and recording firsthand data throughout the process to ensure the accuracy and scientific validity of the tests. Additionally, the research team performed strict quality control and data organization for all the data collected, entering the test results and questionnaire data into Excel spreadsheets, which were then imported into SPSS 25.0 software for statistical analysis. Descriptive statistical analysis and Pearson correlation analysis were employed to process the data, ensuring the scientific rigor and reliability of the results.

Research hypotheses

Through the synthesis of relevant literature, it is evident that there is a close relationship between Motor Quotient (MQ), physical exercise, and sports learning interest. Based on this, the following hypotheses are proposed:

H1: Motor Quotient (MQ) and physical exercise significantly correlate.
H2: A significant positive correlation exists between motor quotient (MQ) and interest in sports learning.
H3: Sports learning interest partially mediates the relationship between physical exercise and motor quotient (MQ).
H4: Physical exercise partially mediates between sports learning interest and Motor Quotient (MQ).

RESULTS

Correlation analysis between motor quotient (MQ) and physical exercise

Pearson's correlation coefficient was used to analyze the correlation between motor quotient (MQ) and physical exercise in college students with non-physical education majors. The specific results are shown in Table 1.

Table 1. Correlation analysis between motor quotient (MQ) and physical exercise (N = 458).

	Motor quotient (MQ)	Exercise intensity	Exercise duration	Exercise frequency	Physical exercise
Motor quotient (MQ)	1				
Exercise intensity	.551**	1	.		
Exercise duration	.676**	.522**	1		
Exercise frequency	.593**	.391**	.700**	1	
Physical exercise	.727**	.747**	.823**	.760**	1

Note: *P < 0.05, **P < 0.01

Based on the analysis of physical exercise, Motor Quotient (MQ) shows a highly significant positive correlation with physical exercise and its various dimensions (P < 0.01), with correlation coefficients of 0.551, 0.676, 0.593 and 0.727, respectively. From the analysis of university students' physical exercise and its dimensions in relation to Motor Quotient (MQ), it can be inferred that higher physical exercise scores are associated with higher Motor Quotient (MQ) levels. Conversely, lower physical exercise scores are associated with lower Motor Quotient (MQ) levels.

According to the results of the correlation analysis between Motor Quotient (MQ) and physical exercise, this indicates that physical exercise has a positive predictive effect on Motor Quotient (MQ) and a positive correlation. Therefore, increasing the intensity, duration, and frequency of physical exercise among university students can enhance their Motor Quotient (MQ) levels. Consequently, Hypothesis 1 (H1) is supported.

Correlation analysis between motor quotient (MQ) and sports learning interest

Pearson correlation analysis explored the correlation

between motor quotient (MQ) and sports learning interest among university students majoring in non-physical education. The specific results are shown in Table 2.

Table 2. Correlation analysis between motor quotient (MQ) and sports learning interest (N=458).

	Motor quotient (MQ)	Enthusiasm	Negativity	Skill learning	Extracurricular sports activities	Sports attention	Sports learning interest
Motor quotient (MQ)	1						
Enthusiasm	.285**	1					
Negativity	.681**	.101*	1				
Skill learning	.417**	-.067	.261**	1			
Extracurricular sports activities	.578**	.022	.696**	.274**	1		
Sports Attention	.549**	-.021	.601**	.169**	.482**	1	
Sports learning interest	.792**	.330**	.856**	.485**	.778**	.717**	1

Note: *P < 0.05, **P < 0.01

Regarding sports learning interest, Motor Quotient (MQ) shows a very significant positive correlation with sports learning interest and its various dimensions (P < 0.01), with correlation coefficients of 0.285, 0.681, 0.417, 0.578, 0.549, and 0.792, respectively. The analysis results between sports learning interest and its dimensions with MQ suggest that higher scores in sports learning interest are associated with higher levels of Motor Quotient (MQ). Conversely, lower sports learning interest scores correspond to lower Motor Quotient (MQ) levels.

The correlation analysis results between MQ and sports learning interest indicate that sports learning interest has a positive predictive effect on motor quotient (MQ), showing a positive correlation. Enhancing university students' sports learning interests and individual dimensions can improve their Motor Quotient (MQ) levels. Therefore, H2 is supported.

Mediating effect of sports learning interest between physical exercise and motor quotient (MQ)

According to the results shown in Table 3, the bootstrap 95% confidence interval for the mediating effect of "sports learning interest" between "physical exercise" and "Motor Quotient (MQ)" does not include zero, indicating that "physical exercise" not only has a direct effect on "Motor Quotient (MQ)" but also has a mediating effect through "sports learning interest." The direct effect (0.327) and the mediating effect (0.269) account for 54.87% and 45.13% of the total effect (0.596), respectively.

"Sports learning interest" has a significant mediating effect between "physical exercise" and "Motor Quotient (MQ)," accounting for 45.13% of the total effect (P < 0.01). This suggests that physical exercise can directly affect the Motor Quotient (MQ) and indirectly affect the Motor Quotient (MQ) through sports learning interests. Therefore, H3 is supported.

Table 3. Mediating effect of sports learning interest between physical exercise and motor quotient (MQ) (N = 458).

	Effect value	SE	LLCI	ULCI	Effect percentage
Total effect	0.596	0.026	0.544	0.648	
Direct effect	0.327	0.025	0.279	0.375	54.87%
Mediation effect	0.269	0.029	0.213	0.326	45.13%

Mediating effect of physical exercise between sports learning interest and motor quotient (MQ)

According to the results shown in Table 4, a significant positive correlation was found between sports learning interest and Motor Quotient (MQ), with both a direct effect and an indirect effect mediated by physical exercise. The mediation analysis showed that the direct effect of sports learning interest on MQ was 0.596, while the indirect effect through physical exercise was 0.252. These effects

accounted for 70.28 and 29.72% of the total effect (0.848), respectively. The bootstrap 95% confidence interval for the mediating effect did not include zero, confirming that physical exercise significantly mediates the relationship between sports learning interest and MQ. This suggests that students with higher sports learning interests are more likely to engage in physical exercise, which in turn contributes to higher MQ levels.

"Physical exercise" has a significant mediating effect between "sports learning interest" and "Motor Quotient (MQ)," accounting for 29.72% of the total effect ($P < 0.01$). This suggests that sports learning interest can directly affect the Motor Quotient (MQ) and indirectly influence the Motor Quotient (MQ) through physical exercise. Therefore, H4 is supported.

Table 4. Mediating effect of physical exercise between sports learning interest and motor quotient (MQ) (N = 458).

	Effect value	SE	LLCI	ULCI	Effect percentage
Total effect	0.848	0.031	0.788	0.908	
Direct effect	0.596	0.032	0.533	0.659	70.28%
Mediation effect	0.252	0.029	0.197	0.311	29.72%

DISCUSSION

This study empirically analyzed the relationship between Motor Quotient (MQ), physical exercise, and sports learning interests among non-physical education students at Y College. The main conclusions drawn from the study are as follows:

The intensity, duration, and frequency of physical exercise were significantly positively correlated with Motor Quotient (MQ), suggesting that students' enthusiasm for participating in physical activities can be effectively enhanced by enhancing MQ. This outcome is consistent with Gardner's Theory of Multiple Intelligences, which posits that enhancing bodily-kinesthetic intelligence can enhance students' performance in physical activities and increase their self-assurance, thereby increasing their motivation to engage in physical activity (Gardner, 1999). Ruiz et al. (2010) also found that youth who showed better motor competency were more likely to start regular physical activity and create lifetime exercise plans, therefore supporting the link between physical activity participation and MQ. Stodden et al. (2008) also proposed a developmental model that suggests that increased physical activity levels in later years are correlated with higher motor skill proficiency in infancy. This reinforces the notion that MQ is essential for maintaining an active lifestyle. On the other hand, some research show that psychological factors such as motivation and self-efficacy could be involved in determining the link between physical activity participation and MQ. Although motor competency increases physical activity levels, low self-efficacy pupils were less likely to engage in sports, according to a study by De Meester et al. (2016), even with appropriate motor abilities.

Interest in sports and motor quotient (MQ) revealed a notable positive link, therefore confirming the interest development model proposed by Hidi and Renninger (2006). This paradigm states that ongoing involvement can convert situational interest—first inspired by outside stimuli—into long-lasting personal interest. In this context, increasing MQ improves students' motor skills, which effectively stimulates their interest in learning sports and encourages long-term participation. Several studies support the relationship between motor competence and interest in learning sports. For example, Robinson et al.'s (2015) study found that students with higher motor competence reported greater levels of enjoyment and motivation in physical education, which strengthens the idea that increasing MQ can promote positive attitudes towards sports. In addition, Chen et al.'s (2020) study showed that students with higher MQ were more likely to engage in structured physical activities due to their increased self-confidence and perceived competence. However, several studies provide a more complex perspective on the relationship between MQ and interest in sports. While motor abilities do increase students' likelihood of participating in sports, Barnett et al. (2008) found that things like peer support and the school environment also help to keep students engaged over time. In a similar vein, Jaakkola et al. (2017) noted that psychological demands such as liberty and social relatedness influence motivation in physical education and might not be derived from MQ.

Furthermore, the study found that sports learning interest significantly mediates motor quotient (MQ) and physical exercise, explaining approximately 45.13% of the total effect. This suggests that improving MQ directly influences physical exercise and indirectly promotes students' participation in physical activities by enhancing their interest in sports learning. This mediating effect verifies the validity of the interest theory in physical education. It indicates that the internal development of interest plays a crucial role in the continued participation in physical activities.

The results of this study indicate that male students have significantly higher scores in sports participation and

interest in learning sports than female students, while there is no significant difference in Motor Quotient (MQ) scores. This finding is in line with research showing that social and cultural factors influence differences in sports participation based on gender (Xiang et al., 2020). While fundamental motor skills exhibited minimal differences between genders, Stodden et al. (2019) identified that societal norms and gender stereotypes frequently influence women's perceptions of sports, consequently diminishing their motivation to engage in such activities. Nonetheless, the subsequent research conducted by Lyu and Gill (2021) underscored the potential for customized instructional strategies—such as those grounded in social engagement and collaborative learning frameworks—to enhance the enthusiasm of female students for physical education. Future physical education ought to incorporate a broader array of pedagogical strategies to mitigate gender bias, enhance the motivation of female students, and foster their active engagement in physical activities.

Overall, this study provides theoretical support for physical education in vocational schools and offers a new perspective for future exploration of the dynamic relationship between Motor Quotient (MQ), physical exercise, and sports learning interest.

Conclusion

This study used non-physical education college students from Y University as the sample to systematically explore the relationship between Motor Quotient (MQ), physical exercise, and sports learning interest. Through a questionnaire survey, actual measurements, and statistical analysis, the study found a significant positive correlation between Motor Quotient (MQ) and physical exercise (correlation coefficients of 0.551, 0.676, 0.593, and 0.727, $P<0.01$), indicating that higher Motor Quotient (MQ) levels are associated with greater engagement in physical exercise in terms of intensity, duration, and frequency. Additionally, a significant positive correlation was also found between Motor Quotient (MQ) and sports learning interest (correlation coefficients of 0.285, 0.681, 0.417, 0.578, 0.549, and 0.792, $P<0.01$), suggesting that higher Motor Quotient (MQ) levels are associated with a greater interest in sports learning. Further mediation effect analysis showed that sports learning interest significantly mediated physical exercise and motor quotient (MQ), accounting for 45.13% of the total effect. At the same time, physical exercise also significantly mediated between sports learning interest and Motor Quotient (MQ), accounting for 29.72% of the total effect. Future research could further investigate the psychological and social factors affecting students' engagement in physical education and evaluate the effectiveness of targeted interventions designed to foster long-term sports participation.

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