The Impact of Educational Informatization and Daily Physical Fitness Management for Improving Students' Physical Fitness at Primary Schools in Nan'an District, Chongqing, China

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Abstract
This study aims to explore the impact of education informatization and daily physical fitness management on improving students' physical fitness in primary schools in Nan'an District, Chongqing. The core question of the study is how educational technology tools, such as smart devices and data platforms, combined with organized physical activity management, impact overall health and fitness outcomes for students. To this end, this study adopted quantitative methods and surveyed 317 teachers in 10 primary schools. Data were collected through questionnaires with the aim of evaluating educational informatization and physical fitness strategies. This research discovered that (1) Educational informatization had positive impacts on the improvement of students' physical fitness in primary school. (R^2=0.721); (2) Daily physical fitness management significantly had positive impacts on the improvement of students' physical fitness improvement (R^2=0.604) and Educational informatization has positive impacts on daily physical fitness management in primary schools (R^2=0.758) at 0.000 significant level. Specifically, education technology's real-time data monitoring and personalized feedback are key to improving physical outcomes. The Sustainable Development Goals, more especially, quality education and good health and well-being, offer insights into how educational technology and physical fitness management might work together to maximize school health.

Keywords: Educational Informatization, Daily Physical Fitness Management, Improving Students' Physical Fitness, Good Health and Well-being

Introduction

The 2022 National Physical Fitness and Health Report for Primary and Secondary School Students highlights a growing concern about obesity, myopia, and declining endurance among students, with issues in strength and endurance being particularly prominent. Schools bear a critical responsibility in improving students' physical fitness by offering adequate sports facilities, scientific physical education programs, and robust health management systems. Nan'an District in Chongqing was selected for this study due to its remarkable advancements in educational informatization and physical fitness management (Qi & Rattanapun, 2024; Rattanapun et al., 2018; Rattanapun et al., 2022).

Among its 68 elementary schools, several have implemented smart devices, digital platforms, and data analytics tools to support daily physical fitness management. These tools enable real-time monitoring of students' physical conditions and help design personalized health management plans. Nan'an District provides a diverse and representative setting for studying the integration of educational informatization and physical fitness management. This research includes ten schools to ensure data comprehensiveness, leveraging the district's strong educational infrastructure and policy support.

Educational informatization has significantly enhanced primary school teaching quality, but its application in physical education remains limited. In Nan'an District, where concerns about students' fitness are rising, the potential for technology to improve physical management has yet to be fully realized. Tools like fitness trackers and mobile apps can provide real-time data, enabling personalized interventions, yet integrating such tools into daily practices is challenging.

Traditional physical fitness management focuses on routine tests, which often neglect broader aspects of physical education like daily physical activities, nutrition, and health education. Many students in Nan'an District lack knowledge about healthy lifestyles and nutrition, which directly impacts their physical well-being. Educational informatization has the potential to address this gap through continuous monitoring and feedback systems that track activity levels, health knowledge, and nutritional intake, creating a comprehensive management system. However, questions remain about how best to integrate these approaches into existing curricula and daily activities. Successful fitness strategies require collaboration between teachers and parents (Rattanapun, 2021). Teachers, empowered by data from educational informatization, can create tailored fitness plans, while parents reinforce healthy habits outside school. Exploring how to effectively combine these roles with modern technology is essential to improving students' physical health. This study seeks to evaluate the impact of educational informatization on physical education management and its potential to improve fitness levels among primary school students in Nan'an District. By analyzing how technology can support health education, data collection, and teacher-parent collaboration, this research aims to provide actionable strategies for creating healthier school environments.

While significant research has been conducted on educational informatization and physical fitness management, most studies focus on secondary and higher education. Few studies address the primary school level, and even fewer involve practical case studies. Despite the emergence of "smart campuses" and the integration of technology into education, Chinese primary schools have been slow to adopt intelligent systems for managing physical fitness. For example, initiatives like the "Smart Healthy Schools" program in Beijing's Dongcheng District remain incomplete, with limited impact on student fitness. Primary school fitness management is still in its early stages, requiring further exploration.

This study aims to fill this gap by focusing on primary schools in Nan'an District, and exploring practical applications of technology to enhance physical fitness management. By bridging the gap between theory and practice, the research contributes valuable insights for optimizing educational informatization and improving student health.

This study investigates the impact of educational informatization and daily physical management on students' fitness in Nan'an District. By integrating information technology into physical education, it explores optimizing routine fitness testing, data collection, and health education. The combination of continuous monitoring, feedback, and teacher-parent collaboration offers a modern approach to managing and improving physical activity. Additionally, it examines how daily physical management, including activities, nutrition education, and health promotion can enhance student fitness. The findings aim to help schools and policymakers develop effective strategies for promoting fitness and healthier lifestyle habits among students. Ultimately, this research highlights how technology can address the limitations of traditional physical education, creating personalized, engaging, and efficient programs tailored to primary school students' needs.

Research Questions

- What is the impact of education informatization for improving students' physical fitness in

primary schools, Nan'an District, Chongqing?
- What is the impact of daily physical fitness management for improving students' physical fitness in primary schools, Nan'an District, Chongqing?
- is the impact of education informatization for the daily physical fitness management in primary schools, Nan'an District, Chongqing?

Research Objectives
- To explore the impact of education informatization for improving students' physical fitness in primary schools, Nan'an District, Chongqing.
- To analyze the impact of daily physical fitness management for improving students' physical fitness in primary schools, Nan'an District, Chongqing.
- To study the impact of education informatization for the daily physical fitness management in primary schools' Nan'an District, Chongqing.

Conceptual Framework

This research is underpinned by three theoretical frameworks: constructivist theory (Piaget, 2013), the systems theory (Bertalanffy, 1968), and the theory of individualized education (Gardner & Hatch, 1989). These frameworks offer a robust theoretical foundation and analytical lens for this investigation.

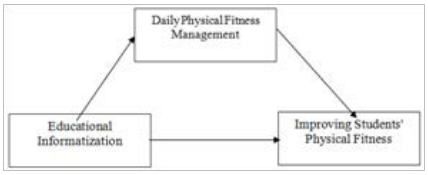


Figure 1 Conceptual Model

Literature Review

The Relationship between Educational Informatization (EI) and Improving Students' Physical Fitness (ISPF)

Educational informatization not only facilitates fitness management but also promotes personalized fitness interventions. Gulbahar and Guven (2008) found that integrating informatization tools like health tracking apps and online platforms improves students' understanding of health, encouraging them to adopt better fitness behaviors.

H1: Educational informatization positively impacts the improvement of students' physical fitness in primary schools in Nan'an District, Chongqing.

The Relationship between Daily Physical Fitness Management (DPFM) and Improving Students' Physical Fitness (ISPF)

Daily physical fitness management encompasses activities such as routine fitness tests, physical exercises, and health education. Hesketh et al. (2017) reported, further enhances the impact of daily fitness management by fostering better habits at home.

H2: Daily physical fitness management significantly impacts the improvement of students' physical fitness in primary schools in Nan'an District, Chongqing.

The Relationship between Educational Informatization (EI) and Daily Physical Fitness Management (DPFM)

Educational informatization involves integrating technology into education to enhance teaching and management. Kirk (2009), improve engagement in physical activities and facilitate health literacy, ultimately enhancing students' fitness. Donnelly et al. (2016) explored how systematic health education combined with physical activity significantly impacts children's physical health. This integration is enhanced by technology, enabling real-time data collection and personalized feedback.

H3: Educational informatization positively impacts daily physical fitness management in primary schools in Nan'an District, Chongqing.

Research Methodology

This research employs a quantitative research methodology (Mohajan, 2020), utilizing a cross-sectional design to gather data aimed at assessing the impact of educational informatization and daily physical fitness management on improving the physical fitness of primary school students in Nan'an District, Chongqing.

The population of the study included teachers from ten primary schools in Nan'an District, Chongqing. These schools were selected based on their implementation of educational informatization and structured daily physical fitness management practices. The schools involved were Danzishi Primary School, Jiangnan Primary School, Dafoduan

Primary School, Shanhu Luneng Primary School, Yinglong Primary School, Tiantaigang Primary School, Shanhuxia Primary School, Huangjiaoya Primary School, Nanping Experimental Primary School, and Longmenhao Longping Primary School. Based on records from these schools, a total of 1,525 teachers were identified as the target population for this study.

In this study, the calculation formula proposed by Yamane (1973) will be adopted to determine the sample size. Yamane's formula was applied by the researchers with a 95% confidence level and a 0.05 margin of error. Its basic form calculated a required sample size of 317. This study employed a stratified random sampling method (Noor et al., 2022) to select participants, ensuring that teachers from all ten schools had an equal opportunity to be included as research subjects, thereby enhancing the representativeness and reliability of the findings. Based on actual data collection, 317 valid questionnaires were obtained for subsequent data analysis. The data collected will be analyzed using SPSS software, encompassing descriptive statistics, reliability analysis, correlation analysis, and regression analysis to examine the specific effects of educational informatization and daily physical fitness management on improving the physical fitness of primary school students.

Results

Descriptive Analysis for Demographic Factors

The data from 317 respondents were collected and analyzed. According to the demographics of the respondents, 47.00% were male and 53.00% were female. Almost all respondents (43.22%) were aged between 35-44 years old. The majority of respondents were teachers, with 35.96% having 11 to 20 years of experience and 35.33% had more than 20 years. In terms of teaching years, the seniority was 42.27%. The following table provides a complete breakdown:

Table 1 Descriptive Analysis for Demographic factors (N=317)

Item	Category	Frequency (f)	Percent (%)
Gender	Male	149	47.00
	Female	168	53.00
Age	18-24 years	34	10.73
	25-34 years	91	28.71
	35-44 years	137	43.22
	45 years and over	55	17.35
Teaching experience	1-2 years	23	7.26
	3-10 years	68	21.45
	11-20 years	114	35.96
	More than 20 years	112	35.33
Year of teaching	Lower grades	88	27.76
	Middle school	95	29.97
	Senior	134	42.27
Total		317	100

Variables Characteristics

Table 2 Descriptive Statistics of Education Informatization, Daily Physical Fitness Management and Students' Physical Fitness Improvement (N=317)

Statement	Mean	SD	Meaning
Education informatization	4.058	0.707	Agree
Daily physical fitness Management	4.031	0.646	Agree
Student Physical Fitness Improvement	4.078	0.676	Agree
Add up the total	4.048	0.621	Agree

(Meaning is related to Likert scale level of agreement)

The data shows that the highest score is for "Student Physical Fitness Improvement", with a mean of 4.078 and a standard deviation of 0.676, indicating that the respondents have a high degree of education informatization with a mean of 4.058 and a standard deviation of 0.707. The lowest score is "daily physical fitness management", with a mean of 4.031 and a standard deviation of 0.646.

The total mean score of each variable is 4.048, indicating that the respondents have a high degree of awareness of the positive impact of educational informatization and daily physical fitness management on improving students' physical fitness. The standard deviation is 0.621, indicating that the respondents have a medium degree of awareness. This shows that integrating technology into education and implementing structured fitness management can effectively promote students' physical health.

Reliability Analysis

The Cronbach's alpha coefficient is a well-established measure for evaluating the reliability of a scale. It provides insights into the consistency of responses across items within each dimension. Cronbach's alpha value greater than 0.9 indicates excellent reliability, between 0.8 and 0.9 reflects good reliability, 0.7 to 0.8 suggests acceptable reliability, and values below 0.7 indicate a need for improvement.

Table 3 Cronbach's Alpha Reliability Analysis of the Impact on Educational Informatization and Daily Physical Fitness Management of Improving Students' Physical Fitness (N=317)

Variable	Alpha Test	Number of Questions
Education informatization	0.834	3
Data collection and analysis	0.854	3
Routine physical fitness tests	0.834	2
Daily physical activity	0.733	2
Nutrition and health education	0.742	2
Health literacy promotion	0.780	2
Integration of information technology	0.781	2
Continuous monitoring and feedback	0.810	2
Teacher and parent involvement	0.773	2
Student physical fitness improvement	0.864	3
Health Behavior	0.844	3
Total	0.962	26

The reliability analysis using Cronbach's Alpha coefficients (Cronbach, 1951) indicated that the internal consistency of each variable was at a good level. Both "Education Informatization" and "Integration of Information Technology" had reliability scores of 0.834 and 0.781, respectively, demonstrating a high level of internal consistency. Variables such as "Data Collection and Analysis" (0.854), "Routine Physical Fitness Tests" (0.834), "Daily Physical Activity" (0.733), "Nutrition and Health Education" (0.742), and "Student Physical Fitness Improvement" (0.864) also showed strong reliability. Meanwhile, the reliability score for the "Health Literacy Promotion" variable was 0.780, indicating an acceptable level of consistency in the survey.

Overall, the total Cronbach's Alpha coefficient for the 26 questions was 0.962, reflecting a very high level of reliability for the entire questionnaire in assessing the impact of daily physical fitness management and educational informatization on the improvement of students' physical fitness. These results demonstrate the robustness and reliability of the survey tool in effectively evaluating the influence of each variable on student fitness improvement.

Correlation Analysis

By calculating the Pearson correlation coefficients between the dimensions of education informatization, daily physical fitness management, and student physical fitness improvement, the research results are as follows:

Table 4 Correlation Analysis of Education Informatization, Daily Physical Fitness Management and Students' Physical Fitness Improvement (N=317)

	Mean	SD	Education informatization	Daily physical fitness Management	Student Physical Fitness Improvement
Education informatization	4.058	0.707	1		
Fitness Management Student	4.031	0.646	0.792***	1	
Physical Fitness improvement	4.078	0.676	0.778***	0.777***	1

Note: *p<0.05; **p<0.01; ***p<0.001

As can be seen from the above table, correlation analysis was used to study the relationship between education informatization, daily physical fitness management, and student physical fitness improvement. The strength of these relationships was expressed using Pearson correlation coefficients.

Specific analysis shows that the correlation coefficient between education informatization and student physical fitness improvement is 0.778, with a significance level of 0.001, indicating a significant positive correlation between the two. This suggests that improvements in education

informatization positively impact student physical fitness improvement.

Similarly, the correlation coefficient between daily physical fitness management and student fitness improvement is 0.75, with a significance level of 0.001, indicating a strong positive correlation between the two. This suggests that effective daily physical fitness management significantly promotes student physical fitness improvement.

The correlation coefficient between education informatization and daily physical fitness management is 0.792, with a significance level of 0.001, indicating a significant positive correlation between the two. This suggests that education informatization helps enhance the effectiveness of daily physical fitness management.

Therefore, H1 is accepted: Education informatization positively impacts student physical fitness improvement. H2 is accepted: Daily physical fitness management positively impacts student physical fitness improvement. H3 is accepted: Education informatization positively impacts daily physical fitness management.

Regression Analysis

Linear regression analysis further verifies the relationship between these variables. For educational informatization (EI), the results show that the integration of information technology (IIT), data collection and analysis (DCA), and continuous monitoring and feedback (CMF) all have significant positive effects on EI. In terms of daily physical fitness management (DPFM), EI also showed significant positive effects. For the improvement of students' physical fitness (ISPF), both educational informatization (EI) and daily physical fitness management (DPFM) demonstrated significant positive impacts in primary schools in Nan'an District, Chongqing. These results indicate that educational informatization not only positively influences the domain of daily physical fitness management but also that the synergistic effect of educational informatization and daily physical fitness management jointly enhances the improvement of students' physical fitness. This underscores the importance of integrating digital technologies and structured fitness programs in fostering holistic physical health development among students.

Table 5 Summary of Hypotheses Result

Variable	Regression Weight	Beta Coefficient	F-values	P-value	Result Hypothesis supported
H1: Education Informatization - Student Physical Fitness improvement	0.721	0.707	223.876	0.000**	supported
H2: Daily Physical Fitness Management - Student Physical Fitness Improvement	0.758	0.725	296.748	0.000**	supported
H3: Education Informatization - Daily Physical Fitness Management (Student Physical Fitness Improvement)	0.604	0.781	453.270	0.000**	supported

Note: *p<0.05; **p<0.01; ***p<0.001

Conclusion

This study collected 317 valid questionnaires to analyze the impact of educational informatization and daily physical fitness management on improving the physical fitness of primary school students in Nan'an District, Chongqing. Through descriptive statistical analysis, reliability analysis, correlation analysis, and regression analysis of various dimensions, the research hypotheses H1, H2, and H3 were confirmed.

The findings indicate that educational informatization significantly enhances daily physical fitness management and directly improves students' physical fitness. Daily physical fitness management also independently contributes to better physical fitness outcomes. Moreover, the synergistic effect of educational informatization and structured fitness management underscores the importance of integrating digital technologies and structured physical education practices to achieve holistic student health improvement.

This study contributes to the existing literature by demonstrating the critical role of educational

informatization in optimizing physical fitness programs in primary schools. It offers empirical evidence on how structured fitness management, combined with technology, can positively influence student health outcomes. The study also emphasizes the applicability of these findings in designing and implementing more effective health and fitness initiatives in similar educational settings.

While the study provides valuable insights, it is limited to primary schools in Nan'an District, Chongqing, which may restrict the generalizability of its findings to other regions or educational systems. Additionally, the cross-sectional nature of the data collection limits the ability to draw causal inferences. Future research could benefit from longitudinal studies to explore the long-term effects of educational informatization and fitness management on student health.

The results of this study have practical implications for policymakers and educators. The integration of educational informatization and structured physical fitness programs can be used as a model to enhance student health outcomes in other regions. Furthermore, the study highlights the potential for expanding these initiatives through the use of advanced technologies, such as wearable fitness trackers and AI-driven feedback systems, to personalize fitness plans and monitor progress. Future research could explore these technological extensions or apply the framework to other age groups and educational contexts.

In conclusion, this study underscores the importance of educational informatization and daily physical fitness management as vital components in improving students' physical fitness. It provides a foundation for further research and practical applications aimed at fostering healthier, more active learning environments for students.

Discussion

Based on the hypothesis test results in the table above, the following can be concluded:

1. Educational informatization has a significant positive impact on the improvement of students' physical fitness: Supported.

The combined influence of educational informatization and daily physical fitness management significantly enhances students' physical fitness outcomes. The synergistic effect highlights how technology can complement traditional fitness programs by enhancing engagement, personalization, and feedback mechanisms. For instance, integrating data analytics with routine fitness assessments provides actionable insights for students and teachers, enabling adaptive strategies to meet individual needs. This synergy creates an innovative framework that not only improves physical health but also fosters a culture of continuous improvement in fitness education.

2. Daily physical fitness management has a significant positive impact on the improvement of students' physical fitness: Supported.

Daily physical fitness management independently contributes to improving students' physical fitness by establishing consistent routines and emphasizing nutrition, health education, and activity monitoring. Structured fitness programs positively influence students' physical well-being and instill lifelong health habits. This is consistent with health behavior theories emphasizing the importance of routine and consistent interventions. Activities such as regular fitness assessments and health literacy promotion enhance students' awareness and participation in physical activities. By providing a balanced approach to physical education, daily management strategies help mitigate the risks of sedentary lifestyles and improve overall fitness outcomes.

3. Educational informatization has a significant positive impact on daily physical fitness management: Supported.

Educational informatization significantly enhances daily physical fitness management by integrating digital tools and technologies into physical education practices. This integration improves the planning, monitoring, and execution of fitness activities, providing students with a structured and technology-supported learning environment.

The findings align with previous research emphasizing the transformative role of educational informatization in managing and improving physical health programs. Digital tools such as wearable fitness devices and data analysis platforms provide real-time feedback, enhance engagement, and enable

personalized fitness plans. This approach optimizes resource allocation and ensures continuity in physical health education, fostering a sustainable framework for daily physical fitness management. The findings demonstrate that the integration of educational informatization with structured physical fitness management not only improves student physical fitness but also provides a model for innovation and sustainable practices in education. Future research can explore the scalability of these findings and investigate their application in different educational contexts.

Recommendations

Based on the analysis results and the relationships between variables, combined with the findings from the verification of research hypotheses, the following recommendations are proposed to promote educational informatization, daily physical fitness management, and the overall improvement of primary school students' physical fitness.

The integration of digital technologies into physical education practices should be strengthened. Schools need to invest in digital platforms, wearable devices, and data analytics tools to personalize fitness plans and provide real-time feedback. These tools not only enhance student engagement but also enable continuous monitoring of physical fitness progress. At the same time, the structure and implementation of daily physical fitness management should be optimized. Developing structured fitness programs, including health education, regular physical fitness assessments, and continuous activity monitoring, ensures sustainability and equitable access for all students, promoting comprehensive development and lifelong healthy habits.

It is essential to foster the synergistic development between educational informatization and physical fitness management practices. By providing training for teachers on using digital technologies effectively and seamlessly integrating these tools into daily physical fitness activities, schools can create a holistic approach to improving students' physical fitness. Additionally, strengthening health literacy and nutrition education is particularly important. Schools should expand health education programs focused on nutrition, healthy behaviors, and literacy promotion while also organizing regular workshops and activities to enhance students' awareness of the importance of maintaining physical and mental health.

Furthermore, schools should encourage the joint involvement of teachers and parents. By organizing collaborative activities, providing training for parents, and establishing effective communication channels, students can receive consistent support for their health initiatives both at home and at school. Meanwhile, advanced technologies such as artificial intelligence, virtual reality, and gamification should be utilized to make fitness education activities more engaging and effective. This can inspire student interest and foster innovation in health management practices.

Overall, these recommendations aim to fully leverage the strengths of educational informatization and daily physical fitness management to comprehensively improve students' physical fitness and establish a sustainable development model applicable to various educational settings.

Research Contribution

This study highlights the significant impact of educational informatization and daily physical fitness management on improving students' physical fitness in primary schools, particularly in fostering healthier lifestyles and enhancing overall educational quality. It provides practical implications for schools seeking to optimize their educational strategies by integrating technological tools and structured physical fitness management practices. By offering insights into how schools can effectively use educational informatization to improve the planning, monitoring, and implementation of fitness programs, the study fosters a culture of health and well-being among students.

Furthermore, the study identifies best practices that can be replicated across other schools, promoting collaboration and knowledge sharing in the education sector. These practices enable schools to share resources, align efforts, and collectively enhance physical education outcomes, contributing to broader educational improvements and healthier communities. Policymakers and educators can leverage these findings to inform decision-making

processes regarding resource allocation, educational equity, and policy development. Governments, in particular, can use these insights to address regional disparities in educational resources, ensuring equitable access to the tools and support needed for effective fitness management.

By emphasizing the integration of digital technologies and structured management strategies, this study contributes to several Sustainable Development Goals (SDGs). It promotes inclusive and equitable quality education by enhancing physical education programs, supports the development of healthy and active students, and fosters economic and community development through improved health outcomes. Additionally, it advances innovation in health education infrastructure, reduces inequalities in educational resources, and provides actionable recommendations for sustainable urban and community development.

In conclusion, study makes a valuable contribution to existing knowledge by offering both strategic and theoretical insights into the role of educational informatization and physical fitness management. A scientific foundation for policy makers to support the promotion of education informatization application on a wider scale to improve students' physical fitness and health and to support the modernization of education management is provided by the optimization strategies and policy recommendations suggested in the study, which include bolstering the construction of education informatization facilities, improving teachers' ability to apply informatization, and encouraging home-school cooperation. for schools, policymakers, and communities to enhance students' physical health, foster educational equity, and achieve broader sustainable development goals.

Further Research

Firstly, future research could investigate the long-term impact of educational informatization and daily physical fitness management on improving students' physical fitness. While this study focuses on immediate effects, a longitudinal approach would allow for a deeper understanding of how sustained implementation of educational technologies and structured fitness management practices influence physical health over time.

Secondly, comparative studies can be conducted across different regions or educational systems. This study is limited to primary schools in Nan'an District, Chongqing. Further research could explore whether similar relationships exist in other regions of China or internationally, providing insights into how varying local and cultural contexts influence the effectiveness of educational informatization and fitness management.

Finally, future studies could explore additional factors that influence student physical fitness, such as family support, socioeconomic status, or access to extracurricular physical activities. While this study emphasizes the roles of educational informatization and daily fitness management, integrating these additional variables could offer a more holistic understanding of the factors driving improvements in student health. Expanding the scope to include these elements would help in designing more comprehensive and equitable health and fitness education programs.

References

Bertalanffy, L. (1968). *General System Theory: Foundations, Development, Applications*. George Braziller.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*(3), 297-334.

Donnelly, J. E., Hillman, C. H., Castelli, D., Etnier, J. L., Lee, S., Tomporowski, P., Lambourne, K., & Szabo-Reed, A. N. (2016). Physical activity, fitness, cognitive function, and academic achievement in children: A systematic review. *Medicine & Science in Sports & Exercise, 48*(6), 1197-1222.

Gardner, H., & Hatch, T. (1989). Multiple intelligences go to school: Educational implications of the theory of multiple intelligences. *Educational Researcher, 18*(8), 4-10.

Gulbahar, Y., & Guven, I. (2008). A survey on ICT usage and the perceptions of social studies teachers in Turkey. *Educational Technology & Society, 11*(3), 37-51.

Hesketh, K. R., Lakshman, R., & van Sluijs, E. M. F. (2017). Barriers and facilitators to young

children's physical activity and sedentary behavior: A systematic review and synthesis of qualitative literature. *Obesity Reviews, 18*(9), 987-1017.

Kirk, D. (2009). *Physical Education Futures*. Routledge.

Maslow, A. H. (1943). A theory of human motivation. *Psychological Review, 50*(4), 370-396.

Menghan, W., & Rattanapun, S. (2024). The influence of team management competencies on high-quality development of Chinese wellness sport enterprises. *Edelweiss Applied Science and Technology, 8*(6).

Mohajan, H. K. (2020). Quantitative research: A successful investigation in natural and social sciences. *Journal of Economic Development, Environment and People*, *9*(4).

Noor, S., Tajik, O., & Golzar, J. (2022). Simple Random Sampling. *International Journal of Education and Language Studies*, *1*(2), 78-82.

Piaget, J. (2013). *The Construction of Reality in the Child.* Routledge.

Qi, Y., & Rattanapun, S. (2024). Optimizing education: How dual teacher technology, communication, and decision-making drive performance?. *Journal of Information Systems Engineering and Management, 9*(4).

Rattanapun, S. (2021). 5G Technology: Re-future the Printing Industry. *The Federation of Thai Printing Industry*.

Rattanapun, S., Khantanapha, N., & Piriyakul, R. (2018). Strategies for survival of the publishing businesses. *International Journal of Management and Business Research*, *8*(3), 39-52.

Rattanapun, S., Khantanapha, N., & Piriyakul, R. (2022). Technology and marketing capabilities management for business retention of the Thai SMEs publishing industry. *Ph.D. in Social Sciences Journal, 12*(2), 504-518.

Yamane, T. (1973). *Statistics: An Introductory Analysis.* Harper and Row.

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