

The Influence of College Physical Education Teaching on Students' Mental Health and Skill Improvement under the embodied cognition Theory

Chunying Ma^{1*}

Abstract

The research aimed to check the influence of college physical education teaching on students' mental health and skill improvement under the embodied cognition theory. The study conducted using a mixed-methods approach, incorporating both quantitative and qualitative data collection methods to comprehensively understand the effects of sports dance teaching on students' physical and mental well-being, aesthetic awareness, and cultural cultivation. The research involved 130 sophomore students from a provincial university who voluntarily participated in the sports dance teaching program. Quantitative data was collected using the SCL-90 self-assessment scale to evaluate the students' mental health and psychological well-being. Questionnaires were distributed twice, at the beginning and end of the semester, to obtain pre-and post-teaching data. The analysis of 120 collected questionnaires showed a significant improvement in the students' mental health levels after the sports dance teaching. The study found that sports dance effectively exercises the cardiovascular system, improves cardiovascular function and endurance, and contributes to body shaping and weight loss. Moreover, participating in sports dance positively impacted students' mental health, reducing factors like depression and hostility, and enhancing interpersonal relationships. The embodied cognition teaching mode played a vital role in regulating and promoting mental health, establishing healthy personalities, and improving aesthetic awareness and cultural cultivation. The sports dance program also enhanced students' music accomplishment, rhythm abilities, learning capacity, and cooperation skills. It fostered a sense of collaboration, friendship, trust, and unity among the students, helping them develop a noble character and a positive outlook on life and the world. Limitations and future directions were also addressed at the end of the study.

Keywords: Embodied Cognition, Physical Education Teaching, Mental Health.

Introduction

In the contemporary rapid changing society, students face increasing pressures and fierce competition, which has a significant impact on their mental health (Xiaocheng, 2023). Many students experience self-cognitive disorders, leading to various psychological issues such as sensitive inter-human relations, obsessive-compulsive disorder, depression, and hostile psychology (Zhang et al., 2021). As they mature, students prefer to socialize using their own perspective, but this can sometimes result in interpersonal communication barriers. Moreover, their ability to handle pressure and live independently is often weak, leading to a host of psychological challenges. Recognizing the crucial role of college students in shaping the future of society, their mental health development is now a priority for various sectors, including education (Lever Taylor et al., 2021). Difficulties integrating into a new learning environment can cause anxiety among freshmen, while impending graduation and employment pressures can lead

to feelings of insecurity and various psychological health problems. Additionally, distorted views on love based on negative emotions can also significantly impact the mental health and personal development of students.

Addressing these challenges requires leveraging physical education as a tool for promoting students' psychological well-being (Beijers et al., 2022; Craig et al., 2022). Physical education can enhance students' adaptability to new environments, foster healthy relationships with peers, and provide a positive learning and growth atmosphere. Engaging in various sports and cooperative activities helps alleviate negative emotions, encourages communication, and improves their ability to adapt to different situations (Huang & Hsu, 2019). The distinctive nature of physical education, being unrelated to personal reputation or academic pressures, allows students to engage in outdoor activities freely, providing a temporary escape from academic worries and promoting mental freedom (Finn et al., 2018). Furthermore, sports can help instill good habits and provide a healthy outlet for stress, thereby

¹School of Physical Education, Hunan University, Changsha, 410082, China. Email: machunying@hnu.edu.cn

*Correspondence: machunying@hnu.edu.cn

contributing to students' overall well-being (Lucas, 2022). While theoretical mental health education is essential, it may not be sufficient to overcome psychological barriers. Students need practical experiences to form correct psychological perspectives and firm beliefs. Physical education can be instrumental in cultivating resilience, patience, and a sense of balance through various sports activities (Weinberg & Gould, 2023). The embodied cognition physical education teaching mode is particularly effective in improving students' core qualities by combining action, experience, and perception with the external environment (Luo & Yu, 2019). By immersing themselves in the physical education experience, students gain a deeper understanding of the subject matter, facilitating their mental and physical development and enhancing their cognitive concepts (Kellert, 2002; Kempermann et al., 2010).

As was previously discussed, fostering the psychological wellbeing of college students depends on the inclusion of mental health education within physical education instruction. Physical education may help students overcome obstacles, build self-confidence, and develop healthy life values by offering a supportive and immersive learning environment. This will enable them to approach their academic path and everyday life with a positive and resilient spirit. The findings also show important ramifications for using sports dancing in educational contexts. First off, sports dancing are a beneficial addition to physical education curricula since it efficiently enhances cardiovascular health, physical fitness, and body form. Second, the benefit to mental health and personality growth emphasizes the potential of sports dance as a tool for fostering emotional stability, social competence, and a good self-perception. Moreover, sports dance enhances aesthetic awareness and cultural cultivation by providing a platform for artistic expression, musical understanding, and appreciation of beauty. The integration of music and dance language fosters students' creativity and learning abilities. Additionally, sports dance encourages collaboration and the cultivation of noble character through its emphasis on teamwork, unity, and positive values. Incorporating sports dance into educational programs can contribute to a holistic approach to education, promoting physical and mental health, artistic appreciation, and the development of well-rounded individuals. The study was divided into five chapters, introduction, literature review, research methodology, data analysis and results, discussion and conclusion.

Literature Review

Physical education plays a very important role in

cultivating students' healthy personality (Zhang, 2021a). Physical education can help students overcome some psychological barriers and relieve psychological pressure, so physical education teachers should encourage students to vent their bad emotions in sports and make students grow up healthily. Good interpersonal communication needs equality, sincerity, tolerance and mutual aid mentality, which can be strengthened by physical education in colleges and universities. In addition, the completion of sports requires unity, cooperation and mutual communication among students, so in order to achieve the purpose of cultivating students' sense of cooperation, this feature of sports can be used to strengthen the communication and exchange between students to successfully complete the teaching task. Mental health education is an important part of sports quality education, sports can make students relax, and then relieve psychological pressure. Through physical practice activities, students can improve their physical and psychological quality. Physical energy will be consumed in sports, and the "dopamine" secreted after sports can also make students feel spiritual pleasure. Moreover, the interactive links in sports projects are more interesting, which can shape students' excellent personality quality, stimulate students' interest in sports activities and improve their self-confidence. In addition, competition in sports activities can also cultivate students' sense of fair competition and teamwork ability, and then make students develop comprehensively.

In physical education, teachers should follow certain teaching principles and teaching methods, reasonably plan the content of mental health education in physical education and mobilize students' enthusiasm for learning physical education through incentive methods. In addition, physical education teachers should fully consider the individual differences between students, for students with good physical quality to improve the standards and increase the difficulty of movement; For students with relatively poor physical fitness, the difficulty of movement should be reduced appropriately, and certain protective measures should be provided to avoid sports injuries. In short, PE teachers should teach students according to their aptitude, so that students at all levels can feel a sense of achievement and enhance self-confidence in sports activities, and correct guidance for the setbacks encountered in life and study, so as to improve students' psychological ability to resist pressure. Wang et al. (2021) Wang et al. (2021) Mental health education is the top priority of physical education teachers in colleges and universities, so physical education teachers should correctly understand the psychological problems of

students, and take positive measures to carry out mental health education to promote the healthy development of students. First of all, the teaching content should be reasonable, and secondly, the difficulty of the teaching content should be mastered, so as to continuously improve students' mental health level and enhance their ability of self-development. Mental health education is the top priority of physical education teachers in colleges and universities, so physical education teachers should correctly understand the psychological problems of students and take positive measures to carry out mental health education to promote the healthy development of students. First of all, the teaching content should be reasonable, and secondly, the difficulty of the teaching content should be mastered, so as to continuously improve students' mental health level and enhance their ability of self-development. Mental health education is the need of students' healthy growth and all-round development, which should be attached great importance by all aspects (Zhang, 2021b). To strengthen mental health education in physical education in colleges and universities, it is necessary to increase the construction of gymnasiums and sports facilities, and effectively create a good physical education environment for students through the allocation of adequate and reasonable physical education equipment, so as to stimulate students' enthusiasm and enthusiasm for physical exercise. Secondly, reasonable teaching content helps students to set up ideal goals, tap their huge potential, and enhance their confidence in learning. The places of physical education are mostly outdoor, and the main forms of students' practice are "learning" and "practicing". A good teaching situation is conducive to optimizing the teacher-student relationship and making students grow up healthily. Finally, it is necessary to improve the evaluation system of physical education teaching. Teachers should comprehensively evaluate students according to their performance in class, so that students can clearly recognize their problems in learning and correct them in time, and constantly improve their mental health level.

At present, college students live in a multi-cultural interwoven society. With the rapid development of the Internet industry, information transmission between people is more convenient and rapid. Meanwhile, the external ideological trends are constantly impacting students (Wen & Wang, 2022). There is even idolatry. Although the Internet has brought many possibilities for our life, production and study, it is undeniable that the Internet is still full of all kinds of bad information, which has a great inducement effect on students' thoughts. Only by strengthening supervision can we give correct guidance and form benign cognitive ability for students. College

students are easily affected by external factors in their outlook on life, values and world outlook. Most college students often pursue individuality and are more resistant to collective life and interpersonal communication. Most of them live in superior conditions at home, and think that they do not ask for anything, insist on their own ideas, and are not willing to listen to the opinions of others, and fail to put themselves in other people's shoes. In the process of interpersonal communication, some students are in a passive state, often face others with an emotional attitude, unable to have an objective evaluation of others, and lack appreciation and affirmation. They can only see their own advantages and ignore their own shortcomings.

According to Wang (2017), In the traditional educational concept, teachers often pay attention to students' achievements in cultural courses, but ignore the importance of physical education courses, college students are in an important stage of physical development, the implementation of scientific physical education management for students, has a profound impact on students' physical health, and also conforms to the important goal of cultivating comprehensive talents in our country. Unified and scientific physical exercise can help students relax their body and mind, promote the healthy development of their whole body, and effectively guide students to communicate and communicate with other students. College students are in the age of active thought and curiosity. Through appropriate physical education, students can be interested in physical exercise and develop good physical habits, laying a good foundation for physical and mental growth. In the long run, cultivating students' sports behavior habits will also have a certain impact on students' learning of other courses.

With the deepening of China's higher education reform, more emphasis is placed on cultivating students' learning interest and healthy psychology under the new curriculum standards. It is necessary to get rid of the traditional teaching thinking, dilute the boring theoretical teaching process, pay attention to the actual physical exercise of students, and strengthen the perception and understanding of sports skills in sports activities. Therefore, college physical education teachers should choose teaching methods that are close to students' life in terms of teaching content. As college students are in an energetic age, they can arouse students' interest by means of sports games, create a warm classroom atmosphere for students, and encourage students to fully integrate into teaching and games. For example, PE teachers should not simply explain to students with theoretical knowledge but should fully develop sports games in line with students' age, promote students to feel the charm of sports, stimulate

students' sense of honor and participation, let students fully like sports courses, and be willing to accept physical education from their hearts, rather than passive learning. In addition, teachers should also pay attention to the ideological work of parents, many parents simply think that students' cultural lessons should be put in the first place, to put a lot of time and energy on cultural lessons, in fact, this idea is very one-sided, while the current college students are in the golden stage of physical development, appropriate scientific physical exercise is particularly important for the growth of students, to arrange reasonable The interspersed teaching allows students to continuously deploy and improve between cultural courses and physical education courses, and promotes the two-way improvement and growth of students (Casado-Robles et al., 2020).

Moreover, embodied cognition theory, a branch of constructivist learning, asserts that human thinking is inseparable from the body and physical education played an important role for this. It highlights the role of the body in cognition, influencing people's thinking style and worldview through its structure, neural activity, and sensory-motor interactions (Fusar-Poli & Santini, 2021). Our cognitive processes are determined by the physical properties of our bodies, and fundamental concepts like spatial orientation and sensory experiences are provided by the body (Sanson & Dubicka, 2022). Cognition is viewed as a system, where the brain, body, and environment interact to perceive, form concepts, and solve problems. Sports dance is a valuable activity that fosters physical and mental health in students. Beyond the physical benefits, learning sports dance enhances aesthetic appreciation, cultural understanding, and overall quality. It also cultivates lifelong exercise habits, aligning with national fitness initiatives and promoting self-expression, interpersonal skills, and creativity (Li, 2021). Moreover, sports dance positively impacts students' ideology, morality, life skills, and intellectual development, encouraging noble values and improving spiritual and moral qualities (Balleine, 2022).

Recognizing the significance of psychological health education for students' comprehensive development, it is vital to prioritize mental health in physical education. This involves providing suitable facilities and equipment to create an encouraging environment that stimulates students' enthusiasm for exercise. Additionally, setting meaningful teaching content and adopting a comprehensive evaluation system enables students to identify and correct their learning issues, promoting their mental well-being (Cruciani & Gagliardi, 2021). College physical education contributes to the formation of a sound personality among students, as they engage in activities

that foster teamwork, adherence to rules, and fair competition. Interaction with teachers and classmates during physical education builds positive relationships and collective values, supporting the development of a harmonious personality. Encouraging respectful conduct in sports competitions helps instill the spirit of fairness and cooperation in students (Tancredi et al., 2021). Implementing sports dance in universities not only enhances physical and mental health but also enriches the cultural atmosphere and artistic cultivation of the campus. To maximize the quality of teaching, effective methods and content should be tailored to each school's specific needs. Moreover, universities should align with national fitness plans and prioritize students' health through lifelong sports and fitness education (Leshchev, 2021; Xu & Wang, 2022).

Thus, based on previous discussion, embodied cognition theory posits that human thinking and cognition are inseparably linked to the body, emphasizing the role of physical experiences and movements in shaping cognitive processes and knowledge acquisition. In the context of physical education, this theory suggests that engaging in sports and physical activities not only enhances students' physical fitness but also has a profound impact on their mental well-being and cognitive abilities (Gurung & Galardi, 2022) Research exploring the relationship between physical education and mental health has highlighted how sports and movement-based activities contribute to the development of resilience, stress reduction, and enhanced mood regulation. Moreover, through experiential learning and repeated practice, physical education can facilitate the improvement of motor skills, coordination, and proprioceptive awareness, ultimately leading to greater self-efficacy and confidence in students' physical abilities. Understanding the implications of embodied cognition in the context of college physical education is essential for designing effective teaching approaches that holistically support students' mental and physical development. The current research is considered to be important to check the influence of college physical education teaching on students' mental health and skill improvement under the embodied cognition theory. This can be shown in Figure.1 below.



Immersive teaching

- Embodied cognition theory
- Immersion theory
- Intelligent technology
- 3D learning scene

Figure 1: Physical Education in Colleges and Universities Can Improve Students' Mental Health and Skills.

Research Methods

The research objective was to test the influence of college physical education teaching on students' mental health and skill improvement under the embodied cognition theory. For this objective, a study was conducted using a mixed-methods approach, incorporating both quantitative and qualitative data collection methods. This allows for a comprehensive understanding of the effects of sports dance teaching on the students' physical and mental well-being, aesthetic awareness, and cultural cultivation. The research subjects consisted of 130 sophomore students from three classes in a certain provincial university who voluntarily participate in the sports dance teaching program. Random sampling used to ensure the participants represent a diverse group of students from the university. The SCL-90 self-assessment scale used to assess the students' mental health and psychological well-being. The questionnaire distributed twice, at the beginning and end of the semester, to obtain pre-and post-teaching data. The scale uses a five-level scoring system, and the data will be analysed to measure changes in mental health levels. 130 questionnaires were distributed and 120 were collected, with a recovery rate of 98%. Compare the physical, psychological, musical rhythm and other qualities before and after the experimental class of sports dance teaching (Dondanville et al., 2021). Classify and statistically analyze the experimental data and use SPSS statistical software for processing.

Data Analysis and Results

Improving body structure and physical fitness for students in a sports dance class in the second grade of the school (including 30 male and 30 female students), after dancing at

Table 1

Comparison of the Total Average Scores, Number of Positive Items, and National Norm for the Study Subjects in Two Trials

	First Survey X SD	Second Survey X SD	National Touch X SD	Comparison Before and After P	Second Regular Comparison P
Total average score	1.44 0.53	1.35 0.38	1.45 0.53		<0.05
Positive number	28 21	23.3 16	25 19	<0.05	

Among the 9 factors in Table 2, the second one is lower than the first one. Among them, there is a significant difference in factors such as "depression" and "hostility" between the two, and compared to the national norm, there is a very significant difference in factors such as "somatization", "interpersonal relationships", "depression" and "hostility". This indicates that sports dance can express emotions, exchange ideas, and communicate with each other in beautiful melodies, enrich students' cultural life in dance, improve interpersonal communication skills, and

the prescribed music speed for 3 minutes, a heart rate test was conducted, and the results showed that the amount of exercise belongs to the upper middle class, which has great benefits for improving human cardiovascular function (Figure 2) (Schrodt & LaFreniere, 2022).

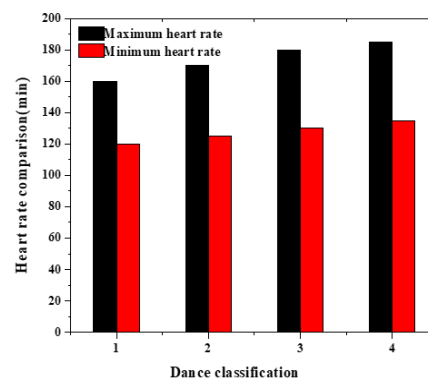


Figure 2: Comparison of Heart Rate Test Results for Sports Dance Exercisers.

From the above data, it is not difficult to see that practicing sports dance can effectively exercise the cardiovascular system, cardiovascular function, endurance, and other aspects. In addition, long-term practice can also exercise the practitioner's body shape, playing a role in bodybuilding and weight loss.

Develop a healthy psychology and establish a healthy personality. By distributing and collecting questionnaires twice at the beginning and end of the semester for three classes of students (30 students in each class), the average and positive numbers of the overall level of the subjects were obtained for analysis and statistics. Compared with the first test, the mental health level of the second test was higher, and there was a significant difference between the two tests. The experimental results are shown in Table 1).

demonstrate the beauty of one's own body, lines, and curves. It can also eliminate fatigue, improve the state of the cerebral cortex, achieve a new balance between excitement and inhibition, and enable the body and mind to get full positive rest. Long term depression, excessive thinking, and emotional unease can increase psychological burden, leading to mental and physical illnesses. Sports dance is a sport that requires participants to be confident during exercise, and every movement should be fully displayed and performed using body language. And in the

practice with dance partners, it is necessary to exchange ideas and cooperate with each other, thereby enhancing the role of interpersonal communication and friendship, and meeting people's spiritual needs. From this, it can be

seen that sports dance plays a positive role in regulating and promoting mental health, establishing a healthy personality, and so on (Coles & Reed - Purvis, 2022).

Table 2

Comparison of SCL-90 Factor Mean Scores Between Two Surveys in the Experimental Group

	First Survey X SD	Second Survey X SD	National Touch X SD	Comparison Before and After P	Second Regular Comparison P
Body	1.27 0.35	1.23 0.26	1.37 0.49		<0.01
Force	1.66 0.47	1.58 0.426	1.63 0.59		
Interpersonal	1.52 0.43	1.44 0.36	1.66 0.62		<0.01
depressed	1.48 0.46	1.39 0.34	1.51 0.58	<0.05	<0.05
anxious	1.44 0.48	1.39 0.37	1.39 0.56		
hostility	1.34 0.46	1.20 0.21	1.47 0.57	<0.01	<0.01
terror	1.36 0.426	1.26 0.25	1.44 0.55		
delusion	1.43 0.38	1.37 0.32	1.24 0.58		
Psychiatric	1.35 0.35	1.31 0.28	1.33 0.43		

Enhancing Aesthetic Awareness and Improving Cultural Cultivation

Improving Aesthetic Abilities Sports dance is a sports event that integrates sports, dance, and music, with strong comprehensiveness and artistry, and rich aesthetic content. The process of sports dance is the process of creating beauty. Through sports dance training, the human body can be more symmetrical and harmonious in appearance, with a more robust and graceful posture, and movements that are both firm and soft. In addition, group dance in sports dance is even more beautiful. The coordinated position of the group and the changes in formation, accompanied by corresponding music, form a dynamic picture that is robust, beautiful, and rich and colorful, providing others with appreciation, combine the beauty of physical form, posture, movement, clothing, and music you see with the beauty of music you hear, and adjust your emotions to achieve harmony and self-appreciation, in order to enjoy beauty (McEwen et al., 2022).

Improve music accomplishment, there are ten dance types in the two categories of sports dance, which are concentrated expressions of ballet, court dance, folk dance, modern dance, etc., covering a wide range. Through learning, one can continuously deepen their understanding of music and dance language. We found that students' music quality is generally poor in the process of sports dance teaching, resulting in difficulty in keeping pace with the music rhythm during the process of completing sports dance movements, and unable to reflect the unique charm of sports dance. Therefore, the teaching process of sports dance in ordinary universities is also a process of cultivating students' musical rhythm ability. When we conducted music tests on 130 students from three

classes of sports dance optional courses who participated in the experiment before and after the start of the class, we found that, they are basically unable to understand the rhythm of music or understand the rhythm of music before learning sports dance classes, and their footwork and rhythm are not synchronized. Through a semester of sports dance learning, students have deepened their understanding of music and dance language, mastered the universal laws of sports and the special laws of dance art, understand the temporal, spatial, and force characteristics of sports dance. The final reflection is that through the visual and auditory organs, students enhance the sensitivity and sensitivity of the human body, which is further reflected in the organic integration of the body and music. This teaching can also familiarize college students with general types of dances and the different characteristics of different types, enhance their participation ability, cultivate students' imagination, understanding ability, and expressive ability towards music. Figure 3 "Before class" represents the measurement during the second class, which is to follow the rhythm of the music and step in place or distinguish the beat of the music (Lalemi, 2022).

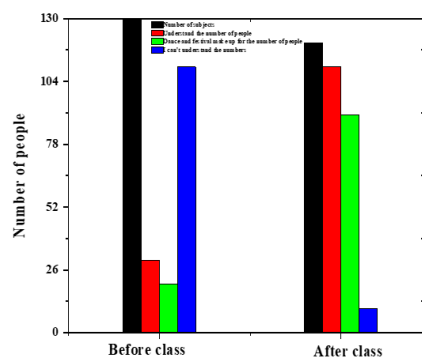


Figure 3: Results of Achievement Test for Students Listening to Music Festival Before and After Class.

Enhancing Learning Ability Due to the diverse movements and relatively complex connections between movements in sports dance, this requires participants in sports dance to move one movement after another in a coherent and reasonable manner along the street. If you want to complete actions correctly and quickly, you must memorize the actions and be responsive. Therefore, through regular practice, it can effectively promote the development of students' reaction ability, visual thinking, memory ability, and imagination, thereby generating unlimited creativity (Foudi & Osés - Eraso, 2022).

Establishing a sense of collaboration and cultivating noble character. Sports dance usually requires mutual cooperation among dancers, through the study of sports dance, the friendship between students has been enhanced, forming a positive spirit of unity and cooperation, a good atmosphere of friendship and trust, and also helping students establish a correct outlook on life and the world. Sports dance education directly affects students' emotional world and resonates, causing them to experience excitement, imagination, and connection, thus consciously accepting the cultivation of moral sentiments, spiritual qualities, consciousness, and even the depths of the soul, just like spring rain nourishing the earth, "with the wind diving into the night, moistening things silently" makes students receive education unconsciously. Sports dance directly and vividly reflects students' deep-seated psychological state, values, and exploration of life significance (Pike et al., 2022). It has the value and function of entertaining oneself, expressing emotions, exchanging emotions, enhancing friendship, fitness and physical fitness, appreciating joy, cultivating sentiment, understanding society, promoting education, and encouraging unity (Waid et al., 2022). So, the function of sports dance lies in its ability to educate students to pursue noble ideological realm and healthy physical beauty and cultivate college students to establish noble moral sentiments.

Discussion and Contributions

The research aimed to check the influence of college physical education teaching on students' mental health and skill improvement under the embodied cognition theory. The study conducted using a mixed-methods approach, incorporating both quantitative and qualitative data collection methods. The results obtained shown that the heart rate test conducted after practicing sports dance at the prescribed music speed for 3 minutes showed that the amount of exercise belonged to the upper middle class. This indicates that sports dance effectively exercises the cardiovascular system, cardiovascular function, and

endurance, leading to considerable benefits for improving overall cardiovascular health.

Moreover, the study on mental health and personality development through sports dance participation demonstrated positive outcomes. The second survey showed that the mental health level of students had significantly improved compared to the first survey. Students reported lower levels of depression and hostility, and overall, their mental health level was higher than the national norm. This implies that participating in sports dancing not only improves physical health but also has a favourable impact on mental wellbeing. Sports dance's expressive character enables students to express their emotions, strengthen interpersonal bonds, and lessen stress and bad feelings. The study also emphasizes how crucial it is to develop cultural understanding and artistic sensibility. Sports dance combines dance, music, and sports to create an immersive and aesthetic experience. Students who practice sports dancing have a more symmetrical and harmonious body posture, which enhances their physical attractiveness. Additionally, practicing multiple dance styles helps students grasp music and rhythm better and introduces them to numerous dance languages.

The results of the data analysis show important ramifications for include sports dancing in academic contexts. First off, sports dancing is a beneficial addition to physical education curricula since it efficiently enhances cardiovascular health, physical fitness, and body form. Second, the benefit to mental health and personality growth emphasizes the potential of sports dance as a tool for fostering emotional stability, social competence, and a good self-perception. Moreover, sports dance enhances aesthetic awareness and cultural cultivation by providing a platform for artistic expression, musical understanding, and appreciation of beauty. The integration of music and dance language fosters students' creativity and learning abilities. Additionally, sports dance encourages collaboration and the cultivation of noble character through its emphasis on teamwork, unity, and positive values. Incorporating sports dance into educational programs can contribute to a holistic approach to education, promoting physical and mental health, artistic appreciation, and the development of well-rounded individuals.

Conclusion

The research aimed was to check the effect of college physical education teaching on students' mental health and skill improvement under the embodied cognition theory was effectively addressed through a mixed-methods approach. According to study results, teaching sports

dance has considerable advantages for students' physical and mental health, aesthetic awareness, and cultural development. The quantitative data analysis showed that sports dancing significantly improved students' cardiovascular health and physical fitness, resulting in a more symmetrical and harmonious body shape. The study also demonstrated that it had a positive impact on students' mental health, as seen by reduced levels of hostility and sorrow and overall higher mental health scores than the national norm. Sports dance has been shown to have considerable positive effects on students' musical ability, aesthetic sense, and academic abilities, demonstrating the all-encompassing and imaginative nature of this kind of exercise. Sports dancing's collaborative component promoted group cohesiveness and cooperation among pupils, fostering the growth of noble character and admirable ideas. These findings thus imply that include sports and dance instruction in college physical education courses can benefit all students. Sports dancing have a

crucial function in fostering mental health and personality development in addition to significantly enhancing physical health. By providing a creative and expressive platform, sports dance enhances students' aesthetic awareness, musical understanding, and artistic appreciation. Moreover, the collaborative nature of sports dance fosters a positive learning environment that encourages teamwork and mutual support. The results suggest that sports dance offers a valuable and comprehensive approach to physical education, impacting not only the body but also the mind and spirit of students. Thoroughly, this study contributes a body of knowledge on the significant of physical education in colleges, particularly highlighting the unique advantages of sports dance in improving students' physical and mental health. With these significant findings, research was not conducted on moderating and mediating variable. Therefore, future research could be explored along with mediating or moderating variable.

References

- Balleine, B. W. (2022). Animal models of action control and cognitive dysfunction in Parkinson's disease. *Progress in Brain Research*, 269(1), 227-255. <https://doi.org/10.1016/bs.pbr.2022.01.006>
- Beijers, R. J., Franssen, F. M., Groenen, M. T., Spruit, M. A., & Schols, A. M. (2022). Physical and mental health profile of patients with the early-onset severe COPD phenotype: A cross-sectional analysis. *Clinical Nutrition*, 41(3), 653-660. <https://doi.org/10.1016/j.clnu.2022.01.015>
- Casado-Robles, C., Mayorga-Vega, D., Guijarro-Romero, S., & Viciano, J. (2020). Sport education-based irregular teaching unit and students' physical activity during school recess. *The Journal of Educational Research*, 113(4), 262-274. <https://doi.org/10.1080/00220671.2020.1806014>
- Coles, S. J., & Reed-Purvis, S. (2022). Reflecting Team Practices outside the therapy room: A thematic analysis of a Child and Adolescent Mental Health Service (CAMHS) away-day process with a team undergoing change. *Journal of Family Therapy*, 44(3), 422-433. <https://doi.org/10.1111/1467-6427.12393>
- Craig, P., Barr, B., Baxter, A. J., Brown, H., Cheetham, M., Gibson, M., Katikireddi, S. V., Moffatt, S., Morris, S., & Munford, L. A. (2022). Evaluation of the mental health impacts of Universal Credit: protocol for a mixed methods study. *BMJ open*, 12(4), e061340. <https://doi.org/10.1136/bmjopen-2022-061340>
- Cruciani, M., & Gagliardi, F. (2021). Cognitive Theories of Concepts and Wittgenstein's Rule-Following: Concept Updating, Category Extension, and Referring. *International Journal of Semiotics and Visual Rhetoric (IJSVR)*, 5(1), 15-27. <https://doi.org/10.4018/IJSVR.2021010102>
- Dondanville, K. A., Fina, B. A., Straud, C. L., Finley, E. P., Tyler, H., Jacoby, V., Blount, T. H., Moring, J. C., Pruiksmas, K. E., & Blankenship, A. E. (2021). Launching a competency-based training program in evidence-based treatments for PTSD: supporting veteran-serving mental health providers in Texas. *Community Mental Health Journal*, 57, 910-919. <https://doi.org/10.1007/s10597-020-00676-7>
- Finn, K. E., Yan, Z., & McInnis, K. J. (2018). Promoting physical activity and science learning in an outdoor education program. *Journal of Physical Education, Recreation & Dance*, 89(1), 35-39. <https://doi.org/10.1080/07303084.2017.1390506>
- Foudi, S., & Osés-Eraso, N. (2022). Information, experience, and willingness to mitigate mental health consequences from flooding through collective defence. *Water Resources Research*, 58(4), e2021WR031357. <https://doi.org/10.1029/2021WR031357>
- Fusar-Poli, P., & Santini, Z. I. (2021). Promoting good mental health in the whole population: The new frontier. *European Neuropsychopharmacology: the Journal of the European College of Neuropsychopharmacology*, 55, 8-10. <https://doi.org/10.1016/j.euroneuro.2021.09.010>

- Gurung, R. A., & Galardi, N. R. (2022). Syllabus tone, more than mental health statements, influence intentions to seek help. *Teaching of Psychology*, 49(3), 218-223. <https://doi.org/10.1177/00986283211994632>
- Huang, W.-Y., & Hsu, C.-C. (2019). Research on the motivation and attitude of college students' physical education in Taiwan. *Journal of Physical Education and Sport*, 19, 69-79. <https://doi.org/10.7752/jpes.2019.s1011>
- Kellert, S. R. (2002). Experiencing nature: Affective, cognitive, and evaluative development in children. In J. P. H. Kahn & S. R. Kellert (Eds.), *Children and Nature: Psychological, Sociocultural, and Evolutionary Investigations* (pp. 117-151). MIT Press. <https://mitpress.mit.edu/9780262611756/children-and-nature/>
- Kempermann, G., Fabel, K., Ehninger, D., Babu, H., Leal-Galicia, P., Garthe, A., & Wolf, S. A. (2010). Why and how physical activity promotes experience-induced brain plasticity. *Frontiers in Neuroscience*, 4, 189. <https://doi.org/10.3389/fnins.2010.00189>
- Lalemi, L. M. (2022). Is it safe here?the importance of providing young people with mental health support. *Chemistry World*, 26(6), 19.
- Leshchev, S. V. (2021). Cross-modal Turing test and embodied cognition: Agency, computing. *Procedia Computer Science*, 190, 527-531. <https://doi.org/10.1016/j.procs.2021.06.061>
- Lever Taylor, B., Kandiah, A., Johnson, S., Howard, L. M., & Morant, N. (2021). A qualitative investigation of models of community mental health care for women with perinatal mental health problems. *Journal of Mental Health*, 30(5), 594-600. <https://doi.org/10.1080/09638237.2020.1714006>
- Li, J. (2021). PMH14 Association between Substance Use Disorder and Mental Health Service Utilization Among Adults with Major Depressive Disorder Using the National Survey on Drug Use and Health. *Value in Health*, 24, S130-S131. <https://doi.org/10.1016/j.jval.2021.04.636>
- Lucas, M. (2022). Clinician Wellness—Self-Care for Staying Healthy: Using Chinese Medicine to Help Prevent Depression and Other Mental Health Issues. *Journal name: Integrative and Complementary Therapies*, 28(1), 17-19. <https://doi.org/10.1089/ict.2021.29002.mlu>
- Luo, J., & Yu, Y. (2019). Application of Embodied Cognition Theory in the Education and Management of College Students' Mental Health Based on "Internet+". In *Application of Intelligent Systems in Multi-modal Information Analytics* (pp. 754-760). Springer. https://doi.org/10.1007/978-3-030-15740-1_99
- McEwen, C., Alisic, E., & Jobson, L. (2022). Moderating role of moral injury in the mental health of adolescent refugees. *Journal of Clinical Psychology*, 78(7), 1478-1490. <https://doi.org/10.1002/jclp.23306>
- Pike, K. M., Rebello, T. J., Hanasaki, S., Narita-Ohtaki, R., Kaufman, P., Akiyama, T., Doerries, B., Yang, L. H., Suzuki, N., & Magill, E. B. (2022). The Tōhoku Theater Project in postdisaster Japan: an exemplar for addressing community mental health in the context of disaster. *Psychiatric services*, 73(6), 712-715. <https://doi.org/10.1176/appi.ps.202000520>
- Sanson, A., & Dubicka, B. (2022). The climate and ecological mental health emergency—Evidence and action. 27(1), 1-3. <https://doi.org/10.1111/camh.12540>
- Schrodt, P., & LaFreniere, J. R. (2022). Witnessing interparental conflict, feeling caught, and mental health: A conditional process analysis involving parental confirmation and divorce status. *Journal of Social and Personal Relationships*, 39(2), 303-324. <https://doi.org/10.1177/02654075211036508>
- Tancredi, S., Abdu, R., Abrahamson, D., & Balasubramaniam, R. (2021). Modeling nonlinear dynamics of fluency development in an embodied-design mathematics learning environment with Recurrence Quantification Analysis. *International Journal of Child-Computer Interaction*, 29, 100297. <https://doi.org/10.1016/j.ijcci.2021.100297>
- Waid, J., Cho, M., & Marsalis, S. (2022). Mental health targets in child maltreatment prevention programs: A systematic review of randomized trials. *Children and Youth Services Review*, 136, 106423. <https://doi.org/10.1016/j.childyouth.2022.106423>
- Wang, N., Rahman, M. N. B. A., & Daud, M. A. K. B. M. (2021). Diversified talent cultivation mechanism of early childhood physical education under the full-practice concept—oriented by preschooler mental health and intelligent teaching. *Frontiers in Psychology*, 11, 593063. <https://doi.org/10.3389/fpsyg.2020.593063>
- Wang, R. (2017). Research on physical education problems and management reform of Chinese colleges and universities. *Eurasia Journal of Mathematics, Science and Technology Education*, 13(10), 7057-7069. <https://doi.org/10.12973/ejmste/78730>

- Weinberg, R. S., & Gould, D. (2023). *Foundations of sport and exercise psychology*. Human Kinetics. <https://us.human-kinetics.com/products/foundations-of-sport-and-exercise-psychology-8th-edition-ebook-with-hkpropel-access>
- Wen, R., & Wang, W. (2022). New Method for Precise Ideological Education for "post-00" Students in The New Media Era based on Big Data. In *2022 3rd International Conference on Artificial Intelligence and Education (IC-ICAIE 2022)* (pp. 909-916). Atlantis Press. https://doi.org/10.2991/978-94-6463-040-4_137
- Xiaocheng, H. (2023). Application of Decision Tree Algorithm in College Students' Mental Health Evaluation. In *2023 IEEE International Conference on Integrated Circuits and Communication Systems (ICICACS)* (pp. 1-6). IEEE. <https://doi.org/10.1109/ICICACS57338.2023.10099654>
- Xu, X., & Wang, F. (2022). Engineering lab in immersive VR—an embodied approach to training wafer preparation. *Journal of Educational Computing Research*, 60(2), 455-480. <https://doi.org/10.1177/073563312111036492>
- Zhang, L. (2021a). The Cultivation Path of Sports Spirit in Colleges and Universities Physical Education. In *2021 2nd Asia-Pacific Conference on Image Processing, Electronics and Computers* (pp. 282-285).
- Zhang, L., Song, X., & Zhang, H. (2021). Research Progress on the Mechanism of College Students' Emotional Disorder and Sports Intervention Program. *Forest Chemicals Review*, 405-417. <https://doi.org/10.17762/jfcr.vi.224>
- Zhang, Y. (2021b). Research on the Countermeasures of College Students' Mental Health Education. *Focus*, 4(14), 72-76. <https://doi.org/10.25236/FER.2021.041413>