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Research Article

Current Status and Optimization Strategies for the Pilot Aerobics Program at Hebei University of Engineering

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ABSTRACT

This study evaluates the aerobics program at Hebei University of Engineering, focusing on its alignment with teaching objectives, content, activities, and plans. The results show that the course has successfully met its teaching goals, with most students achieving "excellent" ratings in the 2022-2023 academic year. However, there is no significant correlation between the course's implementation and academic performance, suggesting that factors like personal confidence, physical fitness, and social skills have a greater impact on student outcomes. These findings highlight the importance of considering non-academic benefits when evaluating the effectiveness of the program. The study recommends enhancing the curriculum by incorporating innovative teaching methods such as interactive activities, competitions, and personalized approaches to better engage students. Additionally, regular reviews and adjustments of the course are recommended to ensure its relevance and effectiveness, ultimately fostering comprehensive student development and long-term growth.

Keywords: National Aerobics Program, Teaching objectives, Teaching content, Teaching activities, Teaching plan, Student performance

1. INTRODUCTION

In the era of advancing socialism with Chinese characteristics, the Chinese government has elevated national fitness as a strategic priority, integrating it into initiatives such as "Healthy China 2030." Among these efforts, national aerobics has emerged as a significant cultural and physical education initiative. Recognized since 2007 as part of traditional ethnic sports, national aerobics blends entertainment and science to preserve cultural heritage while promoting fitness. Policies like the 2022 Physical Education and Health Curriculum Standards advocate incorporating traditional Chinese sports into education, enriching physical education with national characteristics to foster cultural confidence（Yang et al., 2019; Wang & Nie,2019）.

National aerobics, which combines ethnic dance with fitness, is a valuable addition to the curriculum, aligning well with modern educational reforms. This study explores the implementation of the aerobics pilot program at Hebei University of Engineering, focusing on its teaching objectives, content, activities, and overall plan to assess its feasibility as a school-based curriculum. The findings indicate that the introduction of national aerobics can enrich the traditional sports curriculum, promote cultural diversity, and serve as a model for other universities in Hebei. By incorporating these programs, institutions can contribute to both fitness and cultural preservation, supporting the "Healthy China" initiative and educational development.

Hebei University of Engineering, located in Handan City, Hebei Province, is a crucial university with a strong reputation in various disciplines, including education, engineering, and health. The School of Physical Education and Health Engineering at the university offers majors in leisure sports and sports training, with a focus on enhancing student performance through state-of-the-art facilities and competitive sports teams. Since 2014, the university's aerobics team has achieved significant success, securing 20 national championships.

In 2021, the university piloted a National Aerobics Program, supported by its establishment of the "Handan Ethnic Traditional Sports Training Base." This initiative aims to integrate ethnic sports into education, promoting unity and cultural heritage. Despite initial successes, challenges such as outdated teaching materials and pandemic-related disruptions highlighted the need for updates and innovation in the aerobics curriculum.

This study evaluates the implementation of the aerobics program in Hebei University of Engineering, and explores the significant relationship between the implementation of the aerobics program and the performance of the students, finds out the existing problems in the implementation of the aerobics program, and puts forward solutions. Its purpose is to guide the development of college aerobics nationwide, using the program's potential to enrich the educational experience and support cultural preservation. The results of the study will serve as a reference for future pilot projects in 2024-2025.

2. METHODOLOGY

This study employs a descriptive-correlational research design. Participants include students from five freshman and three sophomore classes engaged in the aerobics pilot program. Purposeful sampling ensures the inclusion of students from these pilot classes, totaling eight groups. A researcher-developed questionnaire evaluates four aspects of the aerobics curriculum: teaching objectives, content, activities, and plans. It uses a five-point Likert scale, ranging from "strongly disagree" to "strongly agree," to measure effectiveness.

Four-course experts reviewed the questionnaire for content validity. It was tested with 15 external students, and its reliability was calculated using Cronbach's Alpha.

Ethical approval was obtained from relevant committees. Participation was voluntary and confidential.

3. RESULTS

Table 1a. *Level of Assessment of the Students on the Implementation of the Pilot Aerobics Program in terms of Teaching Objectives*

	Indicator	Mean	Verbal Interpretation
1	The teaching objectives of the aerobics program of the school are based on the national aerobics program.	4.87	Strongly Agree/ Highly Effective
2	The teaching objectives of the aerobics program of the school are formulated by the teachers.	4.86	Strongly Agree/ Highly Effective
3	The teaching objectives of the aerobics program of the school are disseminated to students.	4.92	Strongly Agree/ Highly Effective
4	The teaching objectives of the aerobics program of the school are geared towards improving students' physical fitness.	4.92	Strongly Agree/ Highly Effective
5	The teaching objectives of the aerobics program of the school include the students' aesthetic.	4.93	Strongly Agree/ Highly Effective
6	Aerobics teaching objectives of different grades are formulated according to the actual situation of students.	4.90	Strongly Agree/ Highly Effective
	OVERALL MEAN	4.90	Strongly Agree/ Highly Effective

Legend : 4.21-5.00 (Strongly Agree) | 3.41-4.20 (Agree) | 2.61-3.40 (Uncertain) | 1.81-2.60 (Disagree) | 1.00-1.80 (Strongly Disagree)

As shown in Table 1a, the overall mean for students' self-assessment of the "Teaching Objectives" is 4.90, indicating that students felt the educational experience closely aligned with the course objectives. The highest-rated item, "The instructional objectives of the aerobics program include the development of students' aesthetic skills," with a score of M=4.93, reflects students' recognition of the value of aesthetic training within the program. This likely contributed to increased motivation and engagement. On the other hand, the item, "The instructional objectives of the aerobics program are set by the teachers," received the lowest rating (M=4.86), though still high, indicating that while teachers played a significant role in setting objectives, there may be room for further input from students in the process.

Table 1b. *Level of Assessment of the Students on the Implementation of the Pilot Aerobics Program in terms of Teaching Content*

	Indicator	Mean	Verbal Interpretation
1	The teaching content of the aerobics program of the school are consistent with the teaching objectives.	4.59	Strongly Agree/ Highly Effective
2	The teaching content of the aerobics program of the school are aligned with learning principles of the course.	4.51	Strongly Agree/ Highly Effective
3	The teaching content of the aerobics program of the school is periodically reviewed to meet national standards.	4.46	Strongly Agree/ Highly Effective
4	The teaching content of aerobics can meet the fitness needs and improve the aesthetic ability.	4.78	Strongly Agree/ Highly Effective
5	The teaching content varies from easy to difficult according to the actual situation of students.	4.65	Strongly Agree/ Highly Effective
6	The teaching content of the aerobics program of the school meet the needs of students.	4.59	Strongly Agree/ Highly Effective
7	The teaching content of the aerobics program of the school meets the needs of society.	4.54	Strongly Agree/ Highly Effective
	OVERALL MEAN	4.54	Strongly Agree/ Highly Effective

Legend: 4.21-5.00 (Strongly Agree) | 3.41-4.20 (Agree) | 2.61-3.40 (Uncertain) | 1.81-2.60 (Disagree) | 1.00-1.80 (Strongly Disagree)

Table 1b shows that the overall mean for students' self-assessment of the "Teaching Content" is 4.54, indicating that students generally find the teaching content effective in stimulating their learning interest and helping them grasp the material. The highest-rated item, "The instructional content of aerobics meets students' fitness needs and improves aesthetic skills," scored M=4.78, demonstrating students' positive evaluation of the content in terms of meeting their learning and fitness goals. On the other hand, the item "The teaching content is periodically reviewed to meet national standards" received the lowest score of M=4.46. While still high, this suggests room for improvement in ensuring that the content aligns with national standards, which can further enhance teaching quality.

Table 1c. *Level of Assessment of the Students on the Implementation of the Pilot Aerobics Program in terms of Teaching Activities*

	Indicator	Mean	Verbal Interpretation
1	The teaching activities of the aerobics program of the school course are planned based on the objectives of the course.	4.53	Strongly Agree/ Highly Effective
2	The teaching activities organized by teachers are meaningful.	4.65	Strongly Agree/ Highly Effective
3	Rich and diverse teaching activities.	4.66	Strongly Agree/ Highly Effective
4	Actively participate in teaching activities set by teachers.	4.67	Strongly Agree/ Highly Effective
5	There is good interaction between teachers and students, students and students in class.	4.90	Strongly Agree/ Highly Effective
6	Teaching activities include the effective use of multimedia and technology in the classroom to promote students' learning interests.	4.40	Strongly Agree/ Highly Effective
	OVERALL MEAN	4.63	Strongly Agree/ Highly Effective

Legend: 4.21-5.00 (Strongly Agree) | 3.41-4.20 (Agree) | 2.61-3.40 (Uncertain) | 1.81-2.60 (Disagree) | 1.00-1.80 (Strongly Disagree)

Table 1c reports an overall mean score of 4.63 for teachers' self-assessment of "Teaching Activities," interpreted as "Highly Effective." This reflects students' satisfaction with the practical design and implementation of teaching activities, which promote learning and engagement. The highest-rated item, "There is good interaction between students and teachers and among students," scored M=4.90, highlighting the strong emphasis on active classroom interaction, including discussions and group activities, that enhances learning effectiveness. Conversely, "Instructional activities include effective use of multimedia and technology" scored the lowest at M=4.40. Although rated highly, it suggests room for improvement in leveraging technology to better align with students' expectations and further enhance learning interest.

Table 1d. *Level of Assessment of the Students on the Implementation of the Pilot Aerobics Program in terms of Teaching Plan*

	Indicator	Mean	Verbal Interpretation
1	The school has a well- prepared schedule for teaching planning.	5.00	Strongly Agree/ Highly Effective
2	The teaching schedule or class time allocation is synchronized with the teaching calendar.	4.80	Strongly Agree/ Highly Effective
3	The final teaching plan is informed to the students at the start of the semester.	4.92	Strongly Agree/ Highly Effective
4	The teaching plan is aligned with the objectives of the aerobics program of the school.	4.80	Strongly Agree/ Highly Effective
5	The teaching program is flexible to accommodate the needs and progress of students.	4.60	Strongly Agree/ Highly Effective
6	The teaching plan will be adjusted according to the performance evaluation and feedback of students.	4.87	Strongly Agree/ Highly Effective
7	The design of the teaching plan has an impact on students' performance.	4.67	Strongly Agree/ Highly Effective
	OVERALL MEAN	4.81	Strongly Agree/ Highly Effective

Legend: 4.21-5.00 (Strongly Agree) | 3.41-4.20 (Agree) | 2.61-3.40 (Uncertain) | 1.81-2.60 (Disagree) | 1.00-1.80 (Strongly Disagree)

Table 1d shows an overall mean score of 4.81 for students' self-assessment of the "Teaching Plan," interpreted as "Highly Effective." This indicates students' high satisfaction with the content and organization of lesson plans, which they found supportive of their learning and development. Item 1, "The school has a well-prepared instructional program," scored the highest (M=5.00), reflecting exceptional trust in the school's teaching resources, curriculum organization, and methodologies. Conversely, item 5, "The instructional program is flexible to accommodate student needs and progress," scored the lowest (M=4.60), suggesting a strong but comparatively lower perception of flexibility. While students acknowledge the program's adaptability, the score highlights a potential area for further refinement to address diverse needs.

Table 2. *Level of Aerobics Performance of Students*

Score	Counts	% of Total
90 to 100	148	50.9%
80 to 89	139	47.8%
70 to 79	4	1.4%
60 to 69	0	0.0%
Under 60	0	0.0%
Total	**291**	**100%**

Note. 90-100 (Excellent) | 80-89 (Good) | 70-79 (Average) | 60-69 (Pass) | Under 60 (Fail)

Table 2 shows that the majority of students, approximately 50.9%, achieved "excellent" scores (90-100) in aerobics, indicating strong performance and skill. A further 47.8% scored between 80-89, demonstrating solid proficiency and understanding of aerobics techniques. Only 1.4% of students fell within the 70-79 range, representing a small number of students with average performance. Notably, there were no students in the 60-69 or below 60 categories, highlighting a generally high level of fitness and skill among participants. This aligns with findings from a study at Jilin University, where most of students performed well in aerobics, completing the course requirements successfully. The results suggest that the aerobics program is effective across diverse student levels and that students are highly committed to the training.

Table 3a. *Result of Correlation Analysis (Spearman rho): Implementation of Pilot Aerobics Program and Aerobics Performance of Students (Teaching Objectives)*

		Aerobics Performance
Teaching Objectives	Spearman's rho	0.038
	P-value	0.520

Table 3a presents the correlation analysis using Spearman rho on the implementation of the pilot aerobics program in terms of teaching objectives and the performance of the students. The Spearman's rho was reported to be 0.038 indicating that the positive correlation between the two variables was negligible. The correlation p-value of 0.520 is greater than the commonly used significance level of 0.05, so the observed negligible positive correlation is not statistically significant.

Table 3b. *Result of Correlation Analysis (Spearman rho): Implementation of Pilot Aerobics Program and Aerobics Performance of Students (Teaching Content)*

		Aerobics Performance
Teaching Content	Spearman's rho	0.068
	P-value	0.246

As shown in Table 3b, Spearman's rho was reported to be 0.68 for the relationship between the implementation of teaching content and students' aerobics scores, indicating that the positive correlation between the two variables was negligible. The correlation P-value of 0.246 was more significant than the commonly used significance level of 0.05, so the observed negligible positive correlation was not statistically significant.

Table 3c. *Result of Correlation Analysis (Spearman rho): Implementation of Pilot Aerobics Program and Aerobics Performance of Students (Teaching Activities)*

		Aerobics Performance
Teaching Activities	Spearman's rho	0.014
	P-value	0.810

As for the relationship between the implementation of teaching activities and the impact on students' aerobics scores, Spearman's rho was reported to be 0.014, indicating a negligible positive correlation between the two variables. The correlation p-value of 0.810 was more significant than the commonly used significance level of 0.05, so the observed negligible positive correlation was not statistically significant.

Table 3d.*Result of Correlation Analysis (Spearman rho): Implementation of Pilot Aerobics Program and Aerobics Performance of Students (Teaching Plan)*

		Aerobics Performance
Teaching Plan	Spearman's rho	0.067
	P-value	0.257

As for the relationship between the implementation of the teaching plan and the impact on students' aerobics scores, Spearman's rho was reported to be 0.067, indicating that the positive correlation between the two variables was negligible. The correlation p-value of 0.257 is greater than the commonly used significance level of 0.05, so the observed negligible positive correlation is not statistically significant.

4. DISCUSSION

The primary purpose of this study is to determine the implementation of the aerobics pilot project in Hebei University of Engineering and the analysis of students' achievements, to propose a strengthening plan. According to the survey data, The students have a good evaluation on the implementation of the aerobics plan, and most of the students' performance is rated as "excellent", but there is a negligible positive correlation between the two in the significant correlation test.

As can be seen from Table 3a, there is no significant relationship between the implementation of the aerobics program and the performance of the students. This means that the aerobics course has a high degree of Implementation in terms of teaching objectives, but it has little impact on students' achievements, and students' achievements are still very stable. Through the literature search, it is found that some scholars have confirmed this result. Wu and Fu (2024) proposed that when teaching objectives focus on encouraging competition based on exam scores or avoiding poor performance in class, students may prioritize outperforming others rather than deeply understanding the material. This surface-level learning often relies on memorization or short-term strategies, rather than deep learning, resulting in a weak correlation between teaching goals and academic

achievement. Similarly, when teaching objectives focus on relative performance rather than actual understanding, students may lack motivation for deep learning and fail to develop long-term academic skills. Thus, focusing on external competition may not significantly enhance student outcomes (Sun et al., 2024). In addition, there are also scholars who hold different views. Setting teaching objectives that focus on student knowledge acquisition and understanding can stimulate interest and intrinsic motivation, enhancing deep learning. Well-defined and logical teaching objectives can effectively encourage students' self-directed learning and facilitate the shift from passive to active engagement (Zu,2023; Li,2023).

As shown in Table 3b, The positive correlation between teaching content implementation and students' aerobics performance can be ignored. This means that the aerobics course has a high degree of implementation in terms of teaching content, but has little impact on students' achievements. According to the existing research results, Qiao et al.（2024) proposed that while engaging teaching content, such as peer role videos, can enhance student learning experiences, it does not always significantly impact academic performance. Videos may distract students from core content, hindering deeper understanding and mastery . Likewise, in a study of BSED mathematics, course content that meets educational standards and is organized sequentially does not necessarily lead to improved achievement if teaching relies heavily on memorization, which fails to foster deep understanding (Roman, 2019). In contrast, incorporating students' interests and needs into the curriculum can enhance motivation and engagement, leading to better learning outcomes (Li, 2020). Furthermore, based on Liu (2023), a logical and practical progression of course content helps students develop confidence and skills, boosting their performance. Thus, while adhering to curriculum standards is essential, effective teaching requires balancing rigor with practical application and engaging content to foster deeper learning and improve student achievement.

Besides, according to Table 3c, there is no statistical significance in the positive correlation between the implementation of teaching activities and students' aerobics scores. This means that the aerobics course has a high degree of implementation in teaching activities, but has little impact on students' achievements. Some scholars' research confirms this view. Zhang et al. (2024) points out that reverse engineering teaching activities pay more attention to cultivating students' innovation ability and practical operation ability. However, they do not directly relate to traditional subject knowledge or standardized test content, and the improvement of conventional academic performance is insignificant. And Almazan et al.(2020) proposed that the implementation of teaching activities does not encounter difficulties. Even if the implementation of STEM curriculum provides students with the 21st century skills and abilities they need, it does not necessarily directly affect students' academic performance. On the opposite, some scholars maintain the opposite view, they argued that these activities prioritize creativity and hands-on learning over standardized test content, resulting in high student satisfaction but minimal impact on grades. On the other hand, studies highlight that well-designed teaching activities, including interactive exercises and cooperative learning, can improve academic performance by fostering active participation, critical thinking, and self-directed learning. Through group competitions and extracurricular activities, students gain a deeper understanding of the material, contributing to better academic results (Tian, 2019; Li, 2020).

Similarly, as shown in Table 3d, there was no significant relationship between teaching plans and student achievement. This means that the aerobics course is implemented to a high degree in terms of teaching plans, but it has little impact on students' grades, and students' grades are still stable. Based on the available literature, some authors' research has been found to support this view. Research suggests that while well-designed teaching plans are essential for student achievement, their impact is limited if not correctly implemented. For example, inconsistencies in the execution of teaching plans, such as insufficient practical opportunities or delayed feedback, can hinder student performance (Kan, 2022). Similarly, according to Sun(2021), when teaching plans fail to consider students' needs or interests, or lack proper alignment with learning objectives, students' achievement may not improve as expected. Conversely, optimized teaching plans that carefully allocate class time and focus on complex concepts can significantly improve student performance. Ultimately, a well-executed, flexible teaching plan that addresses students' needs and provides ample practice opportunities can improved student achievement (Liang, 2019; Zhou & Yin, 2023).

5. CONCLUSION

The school may further promote the curriculum reform based on continuing to ensure the existing implementation plan. It is recommended that teaching objectives be regularly assessed and adjusted to ensure that they are aligned with student needs and social developments. Moreover, the content of the course may be more abundant, and the learning of the theoretical knowledge of minority dance may be increased to improve the ability of students comprehensively. In addition, innovative elements

can be incorporated into the teaching activities, such as national fitness competition, themed activities and group projects, to stimulate students' enthusiasm for participation and competitive consciousness, and improve the teaching effect. At the same time, it is suggested to regularly review the implementation effect of the teaching plan, analyze the impact on students' learning, and timely optimize and adjust the content of the plan to ensure the coherence and systematization of the curriculum, and ultimately achieve the improvement of students' performance and quality.

This study provides critical insights into the national aerobics program's development and implementation, emphasizing the need for ongoing curriculum reform. Regularly updating teaching goals ensures alignment with student needs and societal trends, enhancing student engagement and outcomes. Innovative teaching strategies, such as competitions and group activities, foster participation and competitiveness, boosting learning results.

Moreover, the study underscores the importance of prioritizing physical health in education, aligning with national standards to ensure students' fitness and well-being. Active efforts from schools, teachers, and students are vital to maintaining high assessment standards and supporting holistic development.

Finally, by analyzing factors like personal interests and extracurricular activities, schools can create more engaging and effective teaching environments. Although the direct correlation between curriculum and grades is weak, incorporating interactive teaching methods and organizing performance and competition-based activities can significantly improve students' interest and overall development. Continuous evaluation of the aerobics curriculum will ensure it meets student needs and contributes to their comprehensive growth.

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