

Research on the innovative teaching mode of rhythmic gymnastics course under the condition of multimedia and network technology

Li Cui^{1,2,a}

¹Tianjin University of Sport, Tianjin, China

²Philippine Christian University, Manila, Philippine

^acuiliningmeng@sina.com

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Abstract: With the rapid development of multimedia and network technology, rhythmic gymnastics courses need to be innovated in the teaching mode. This paper aims to explore innovative teaching mode and apply multimedia and network technology to rhythmic gymnastics courses to improve students' learning effect and interest. Through the implementation of this innovative teaching mode, it aims to provide valuable reference for the field of rhythmic gymnastics education, enhance students' interest in rhythmic gymnastics courses, and promote students' comprehensive development in skills, performance, creativity and other aspects.

Rhythmic gymnastics is a unique sports form combining dance, gymnastics and artistic elements, which can not only cultivate students' coordination, flexibility and strength, but also cultivate students' expression ability and aesthetic taste. Multimedia and network technology can enrich the teaching content through audio, video and image forms, so that students can understand and perceive the essentials of action more intuitively. Through the research of innovative teaching mode, the combination of multimedia and network technology with rhythmic gymnastics course teaching, is expected to improve students' learning effect and interest, and bring positive influence for the development of the field of rhythmic gymnastics education.

1. Study Subjects and Methods

1.1 Research object

In this study, 60 students from grade 21 and 22 in rhythmic gymnastics were divided into experimental group and control group according to grade and class. 30 students in each group in each year, which can better reflect the influence of innovative teaching mode on students.

1.2 Research methods

1.2.1 Literature method

By collecting relevant literature, including domestic and foreign application cases of multimedia and network technology in teaching, and research results of teaching mode of rhythmic gymnastics courses, the research topics are summarized on theoretical and practical basis.

1.2.2 Experimental research method

The experimental group and the control group respectively conduct the teaching practice of rhythmic gymnastics course. The experimental group adopts innovative teaching mode, including multimedia teaching and network interactive teaching, and the control group adopts the traditional teaching mode. By observing and recording students' learning performance, performance evaluation and other indicators, the influence of innovative teaching mode on students' learning effect is analyzed.

1.2.3. Mathematical statistics method

Data analysis and statistical processing of the experimental results, and appropriate mathematical statistical methods are used to compare and evaluate the learning performance of the experimental group and the control group, so as to verify the effectiveness and advantages of the innovative teaching mode.

2. Theoretical system of innovative teaching mode of rhythmic gymnastics course under the condition of multimedia and network technology

2.1 Innovative teaching ideas of rhythmic gymnastics courses under the condition of multimedia and network technology

Under the condition of multimedia and network technology, the innovative teaching ideas of rhythmic gymnastics course include the main path ^[1] of multimedia teaching content enrichment, network interactive teaching platform construction, personalized learning support, practice and creativity training, teaching evaluation and continuous improvement and so on. In the teaching process, teachers can use multimedia technology to present rich teaching content, including audio, video and image forms, so as to provide intuitive and vivid learning experience. These activities stimulate students' interest and motivation through excellent artistic gymnastics performances, skill explanations and demonstrations. Building an online interactive teaching platform can provide students with opportunities for online learning and communication. Through online discussion, interactive games and virtual practice, students can promote cooperation and communication among students and enhance learning effect and experience ^[2]. The application of multimedia and network technology also provides students with more practical and creative opportunities. For example, students are encouraged to use multimedia tools to record and edit their own rhythmic gymnastics performances, an activity that cultivates their creativity and expression skills^[3]. However, in the process of carrying out innovative teaching, there is a lack of a system model that can guide it. Therefore, this paper proposes to form innovative ideas based on the characteristics of complex systems. On this basis, according to the cognitive model theory, this paper proposes the innovative teaching model of rhythmic gymnastics course under the condition of multimedia and network technology, as shown in formula 1.

$$CSTRCM = T \oplus M \oplus H \oplus C \oplus F \oplus P \quad (1)$$

In the model, T, M, H, C, F and P represent six factors: teaching, administration, hardware conditions, cognitive identity, characteristic attraction and promotion. The operators show that these six main factors play an important role in the aerobics teaching reform and are the indispensable core factors.

2.2 Regular teaching methods and rhythmic gymnastics course teaching procedures under the conditions of multimedia and network technology

The traditional teaching mode (Figure 1) often relies on teachers' oral explanation and the teaching of book knowledge, resulting to single teaching content and boring presentation form. In traditional teaching, teachers often play the role of information transmitter, will instill a lot of knowledge to students, and students undertake the knowledge taught, so that students lack the opportunity to actively learn and think, affect students' learning motivation and enthusiasm^[4]. Learning is supposed to be an active experience, but in traditional teaching, students may feel that learning becomes boring, which will resist the learning content and affect the learning effect. Teachers have to undertake a large number of teaching tasks, such as preparing lesson plans, preparing lessons, explaining lessons, assigning homework and exams, etc., which makes the workload of teachers heavier, which may lead to the failure to fully guarantee the teaching quality and make the work burden of teachers heavier^[5].

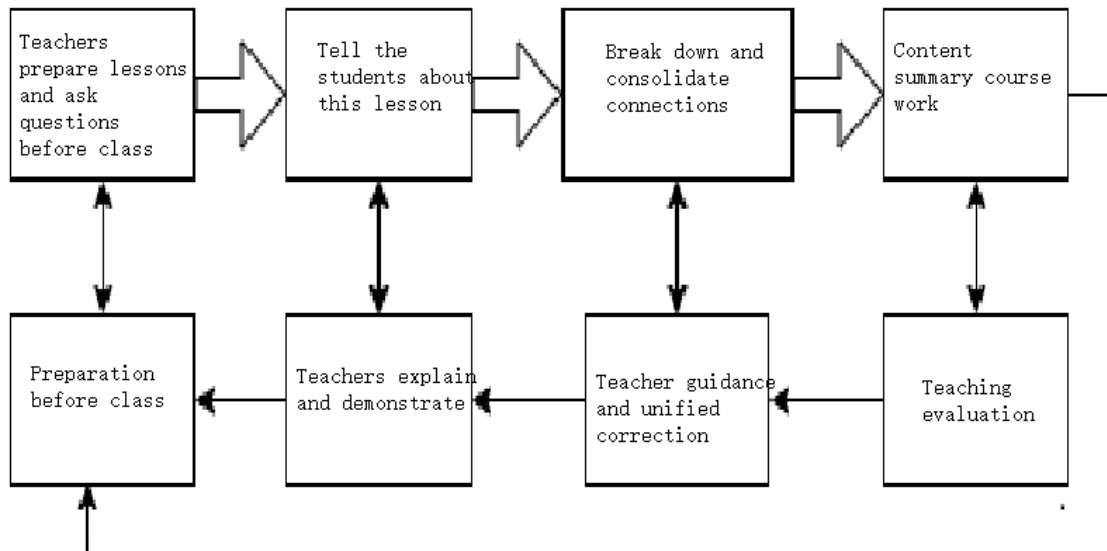


Figure 1: Flow chart of traditional teaching method in rhythmic gymnastics teaching

Under the condition of multimedia and network technology, the teaching procedure of rhythmic gymnastics course can be innovated and optimized to enhance students' learning experience and interest. The teaching procedure of rhythmic gymnastics course under the condition of multimedia and network technology (Figure 2) can be divided into four main parts: diversified introduction, video and training, interactive training between students and summary evaluation. Teachers through the use of multimedia technology, display wonderful rhythmic gymnastics performance video, through the introduction of relevant knowledge of rhythmic gymnastics, stimulate students' interest and curiosity^[6]. The application of multimedia resources can make the introduction process more vivid and interesting, attract students' attention, and lay a good foundation for the understanding and acceptance of the learning content. Under the condition of multimedia and network technology,

teachers can play the demonstration video and let students follow the practice. By watching videos repeatedly, students can independently adjust and correct the movement skills to improve the effect of self-learning, so that students can more intuitively understand and master the technical essentials of rhythmic gymnastics, and enhance the practicality and pertinacity of learning. Using the network interactive teaching platform, teachers can organize the interactive training between students. Students can show their rhythmic gymnastics performance and communicate and interact with other students. Interactive training between students can promote cooperation and competition between students, stimulate their learning motivation and creativity [7]. In the final stage of the course, teachers can summarize and evaluate the course by using multimedia display of students' performance videos, discussing and sharing their learning experiences. Through the evaluation process, students can reflect on and summarize their learning results, and teachers can also give timely encouragement and guidance to help students to further improve.

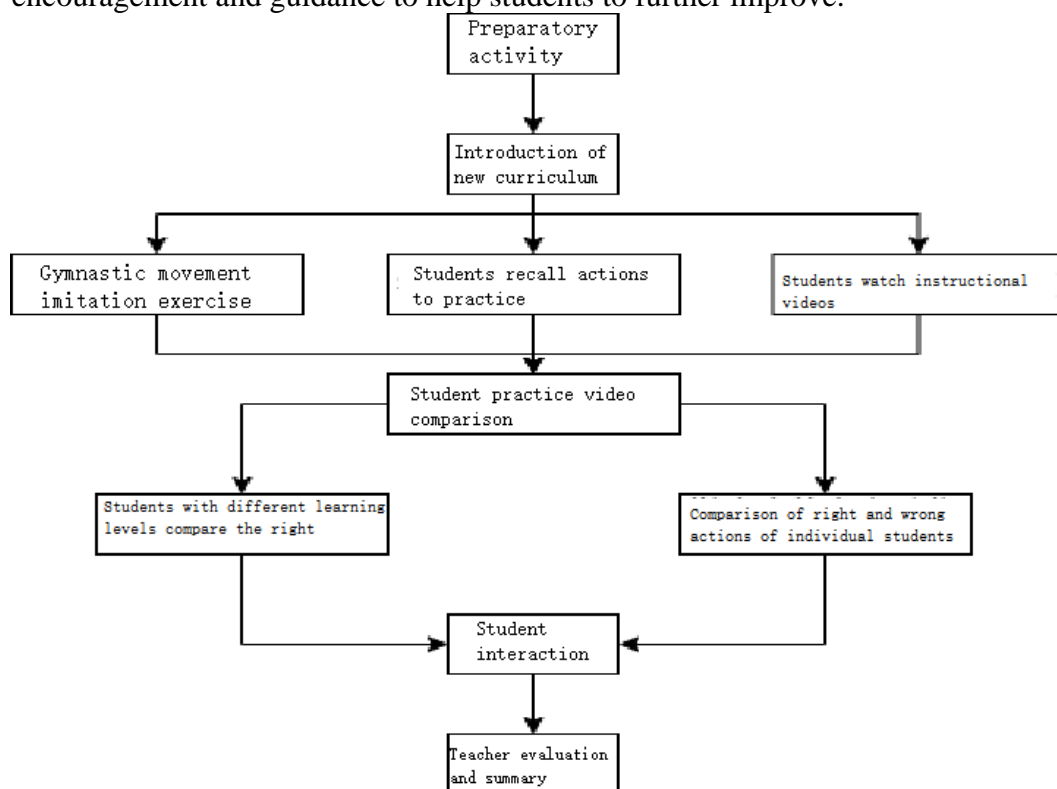


Figure 2: Flow chart of multimedia and network technology in rhythmic gymnastics teaching

2.3 Evaluation system of rhythmic gymnastics course under the condition of multimedia and network technology

The examination content of the traditional evaluation system is relatively simple, usually based on the written examination of theoretical knowledge and basic technical movements, ignoring the creativity and expressive force of artistic gymnastics, and it is difficult to comprehensively evaluate the students' comprehensive ability and creative ability in artistic gymnastics. The examination method of the traditional evaluation system is relatively fixed, often using the form of closed-book examination or standardized action performance, lack of flexibility and personalization, the rigid evaluation method may not accurately reflect the performance and progress of students in the actual practice [8]. The traditional evaluation system pays too much attention to examination results. Students' evaluation is mainly based on scores, ignoring the careful evaluation of students'

movement skills, creativity and artistic performance, which that students pursue high scores too much, while ignoring the fun of rhythmic gymnastics learning and personal development. Multimedia and network technology, by contrast, under the condition of artistic gymnastics course evaluation system (figure 3) in the aspect of examination content is divided into theoretical content and practical content, theoretical content main evaluation students theoretical knowledge of innovative artistic gymnastics, including the history of artistic gymnastics, development, skills, movement elements of knowledge. Theory test can use multiple choice questions, fill in the blanks, short answer questions and other forms^[9]. The practice content mainly evaluates students' ability to use innovative artistic gymnastics skills and movement elements in practical operation, including students' performance of innovative artistic gymnastics movements, completing specific skills requirements and bedside practical tasks, which can adopt the form of performance evaluation, practical operation evaluation and so on. Examination method atmosphere according to the evaluation subject and according to the evaluation time, according to the evaluation subject can be divided into teacher evaluation and self-evaluation of two ways. According to the evaluation time, it can be divided into the usual assessment and the final assessment. The usual assessment is to evaluate the performance of students in the course learning process, and the final assessment is to summarize and evaluate the learning results of the whole semester or academic year^[10]. The examination results are divided into two aspects: normal results and final results. The usual results are the results given according to the results of normal assessment, reflecting the performance and effort of students in the course learning process, which may account for a certain proportion of the overall results. The final score is the score given according to the results of the final assessment, which can comprehensively evaluate students' learning results and ability level in the whole semester or academic year.

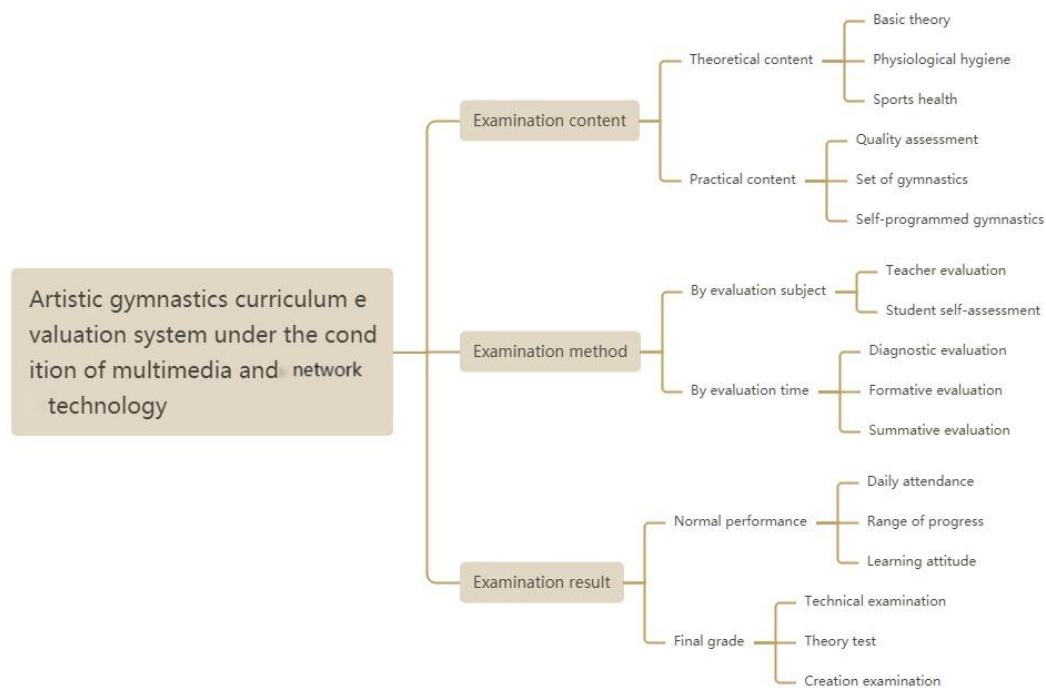


Figure 3: Evaluation system of rhythmic gymnastics course under the condition of multimedia and network technology

3. The implementation effect of the innovative teaching mode of rhythmic gymnastics course under the condition of multimedia and network technology

3.1 Comparative analysis of students' indicators after the innovative teaching mode experiment

Table 1: Control table of students' indicators after the innovative teaching mode experiment

grade	group	number of people	average score (U)				P/S
			T	B	Tq	I	
grade21	experiment	30	88.6	80.1	81.2	87.1	0.36/0.64
	contrast	30	77.9	78.1	63.8	61.2	
grade22	experiment	30	89.1	82.7	86.9	86.7	0.55/0.44
	contrast	30	74.9	64.1	65.3	62.8	

The experimental indicators of innovative teaching mode are shown in the table above. The experimental indicators are selected as: theoretical level (T), physical quality (B), technical level (Tq) and creative ability (I). P / S (Pearson correlation and correlation significance coefficient) is the result of the statistical analysis of the correlation between the indicators, where P represents the correlation coefficient and S represents the correlation significance coefficient. The correlation coefficient measures the degree of correlation between the variables, and the correlation significance coefficient determines whether the correlation is significant.

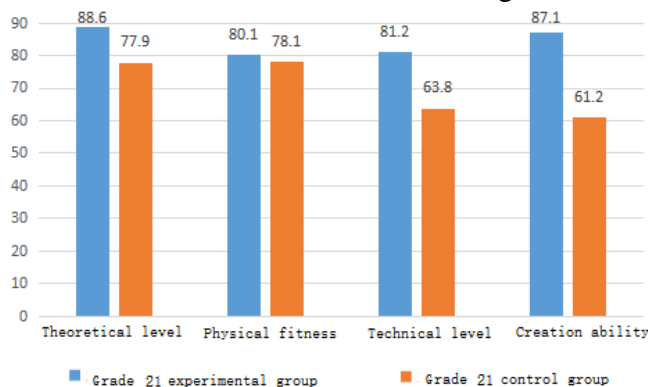


Figure 4: Comparison chart of students' average scores of various indicators after the grade 21 experiment

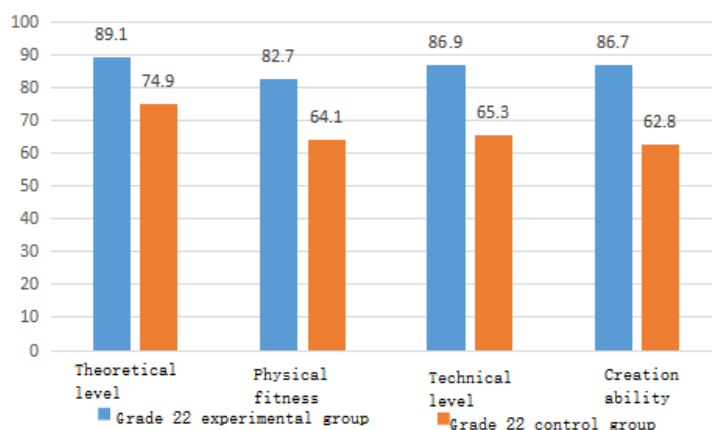


Figure 5: The average score of students after the grade 22 experiment

According to the analysis of Table 1, Figure 4 and Figure 5, we can see that among the students of grade 21, the average score of the experimental group is higher than that of the control group in all indicators, indicating that the innovative teaching mode has a positive impact on the indicators of the students of grade 21. Among the students of the 22 level, the average score of the experimental group was also higher than that of the control group in all indicators, which further verified the positive impact of the innovative teaching model on the students' indicators. From the P / S data, the value of the correlation coefficient is between 0.36 and 0.55, indicating that there is a certain degree of positive correlation between the indicators. To sum up, the innovative teaching mode has a positive impact on the theoretical level, physical quality, technical level and creative ability among the students in the experimental group.

3.2 Comparative analysis of students' comprehensive performance of rhythmic gymnastics after the innovative teaching mode experiment

Table 2: Control table of the students' comprehensive results of rhythmic gymnastics after the innovative teaching mode experiment

	N	Minimum	Maximum	Mean	Std.Deviation
Group 21,22 control group	60	70.00	92.00	84.8750	6.97828
Group 21,22 experimental group	60	90.00	95.00	92.6250	1.68502

According to Table 2, in the control group, the students' comprehensive rhythmic gymnastics scores ranged from 70 to 92, with an average score of 84.875. The standard deviation is 6.97828, which means that the distribution of grades is relatively scattered and there are some differences. In contrast, students in the experimental group performed better in the overall performance of rhythmic gymnastics, with student grades ranging from 90 to 95 with an average score of 92.625. The standard deviation was 1.68502, indicating a more concentrated distribution of grades in the experimental group.

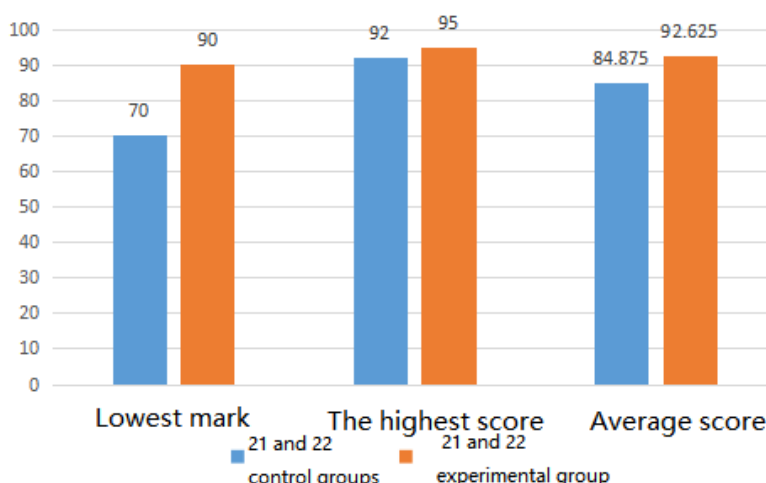


Figure 6: Comparison chart of students' comprehensive performance in rhythmic gymnastics after the innovative teaching mode experiment

As can be seen from Figure 6, by comparing the results of the two groups of students, it can be seen that the innovative teaching mode has a positive impact on the comprehensive performance of students in rhythmic gymnastics. The average score of the students in the experimental group was significantly higher than that in the control group, indicating that the innovative teaching model could improve the students' artistic gymnastics skills and performance ability. In addition, the

performance distribution of students in the experimental group is more concentrated, reflecting the overall improvement of students' performance by the innovative teaching mode.

3.3 Comparative analysis of students' interest in learning rhythmic gymnastics after the innovative teaching mode experiment

According to Figure 7, in the experimental group, 72% of students were interested in learning rhythmic gymnastics, the highest proportion, only 5% expressed no interest, and the remaining 23% held a neutral attitude. In contrast, the proportion of students interested in learning rhythmic gymnastics was lower at only 48%. Thirty-nine percent said they were neutral about learning rhythmic gymnastics, while 13 percent expressed no interest in learning rhythmic gymnastics. By comparing the learning interest of the two groups, it can be found that the students in the experimental group are significantly more interested in learning rhythmic gymnastics than the control group, which shows that the innovative teaching mode can have a positive impact on the students' learning experience and interest. Through innovative teaching methods and teaching content, the students in the experimental group are more likely to experience the fun of rhythmic gymnastics and stimulate their interest in learning. Students' interest in learning is an important driving factor, which can promote students to participate more actively in learning and achieve better learning results. The adoption of innovative teaching mode is helpful to improve students' interest in rhythmic gymnastics learning, and then promote the positive development of students in this field.

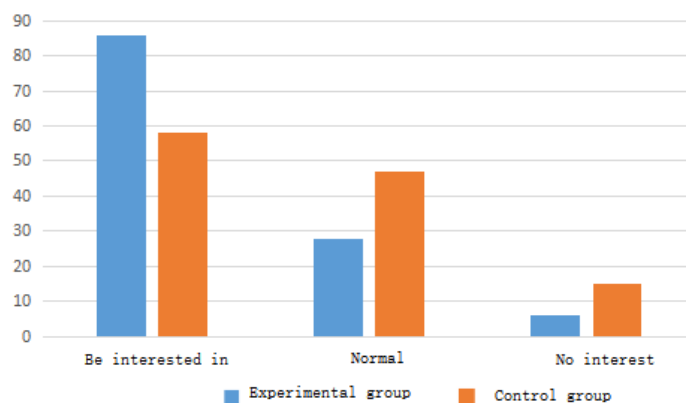


Figure 7: Comparison of students' interest in learning rhythmic gymnastics after the innovative teaching mode experiment

3.4 Evaluation of the implementation effect of the innovative teaching mode of rhythmic gymnastics course under the condition of multimedia and network technology

Through the above comparative data results, it can be seen that under the condition of multimedia and network technology, the implementation effect of the innovative teaching mode of rhythmic gymnastics course is positive. The innovative teaching mode has a positive impact on students' learning experience, interest and various indicators with its innovative teaching methods and teaching content. Through the application of multimedia technology, the innovative teaching mode provides students with rich and diverse learning resources. Students can more vividly understand the skills and expression methods of rhythmic gymnastics through multimedia elements such as audio-visual materials, images and videos. The multimedia presentation mode makes the learning content more intuitive, and stimulates the students' interest in learning and curiosity. At the same time, the introduction of network technology also provides students with a broader space for

learning. Students can obtain relevant information through the network platform, communicate and interact, and broaden their learning horizon. In terms of theoretical level, physical quality, technical level and creative ability, the average score of the students in the experimental group was significantly higher than that of the control group. The correlation analysis results show that there is a certain degree of positive correlation between various indicators, indicating that the innovative teaching mode has a comprehensive improvement effect on students' multiple ability dimensions. In addition, in terms of the comprehensive performance and learning interest of rhythmic gymnastics, the students in the experimental group showed better performance and higher interest in learning, which showed the overall improvement and positive impact of the innovative teaching mode on the students. Through the innovative teaching mode, students' indicators have been comprehensively improved, so the promotion and application of innovative teaching mode is of great significance to promote the positive development of students in the field of artistic gymnastics.

3.5 Suggestions on the implementation of innovative teaching mode of rhythmic gymnastics course under the condition of multimedia and network technology

Integrating multimedia resources is one of the key steps to implement the innovative teaching mode under the condition of multimedia and network technology. Using multimedia technology to provide rich teaching resources for rhythmic gymnastics courses, can greatly enrich the teaching content, enhance students' learning experience^[11]. Teachers can use multimedia display technology, show students artistic gymnastics skills, performance cases and excellent players performance video, by showing wonderful images, video and audio, students can more intuitive understanding of rhythmic gymnastics action essentials, rhythm and stage performance skills, not only can stimulate students' interest, also can let them feel the beauty and charm of artistic gymnastics, to more actively participate in the learning. Multimedia resources can also provide more learning reference materials and teaching auxiliary tools, teachers can related text materials, diagram and demonstration animation into electronic documents or the form of online teaching courseware, for students to autonomous learning and review, flexible teaching resources form that students can learn according to their own learning progress and demand, choose the right learning style and time. Considering the influence of multimedia and network technology on rhythmic gymnastics teaching, evaluation index should be more comprehensive and diversified, in addition to the traditional technical level and performance ability, but also can consider to add the use of multimedia technology, creative expression ability and students on the network platform of interaction and cooperation ability, these indicators can more comprehensively reflect the students in multimedia and network environment of comprehensive accomplishment and learning ability. Multimedia and network technology can provide more data and information, and teachers can combine data analysis and visual display to better understand students' learning situation and evaluation results. For example, the online learning platform learning records and work uploads can be used to make quantitative analysis and visual display of students' learning progress and performance, so as to further provide teachers with more accurate evaluation basis and guidance for teachers.

4. Conclusion

According to the implementation effect of the innovative teaching mode in this study, students have made a significant improvement in various indicators, comprehensive scores and learning interest. The application of multimedia and network technology has enriched the teaching content of rhythmic gymnastics course, improved the flexibility and interactivity of teaching, enabled students to participate in and explore more actively, and provided better teaching and learning experience for educators and students. Future research could further explore how to optimize innovative teaching

models to adapt to growing multimedia and network technologies and promote them in a wider range of education.

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