Advantages of Multimedia Network Teaching in Ice and Snow Sports Education in Higher Vocational Colleges

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Abstract. With the continuous development of artificial intelligence technology, more and more fields in China gradually develop with new technology. The education industry is also constantly pursuing innovation, among which more and more colleges and universities gradually use multimedia network teaching. The purpose of this study is to analyze the advantages of multimedia network teaching in ice and snow sports teaching in higher vocational colleges. This study selects the ice and snow sports course teaching of some universities in Heilongjiang Province as the research object, and divides it into different experimental groups through different teaching methods. Finally, it makes statistics on students' achievements and teaching feedback, and reflects the role and influence of multimedia network teaching combined with the standard of t test. The results show that the popularity rate of online teaching has also increased from 8.5% in 2012 to 42.1% in 2019. And 87.9% of teachers and students support and are satisfied with the content and method of multimedia teaching. It is concluded that the multimedia network teaching discussed in this research has played a good role in the teaching of ice and snow sports, and has high efficiency, which has contributed to the development of smart devices in the education field.

Keywords: Multimedia Teaching, Network Advantages, Vocational Colleges, Ice and Snow Sports

1. Introduction
With the development of the world economy, science and technology has made unprecedented development in this economic wave. First of all, computer information technology has been widely popularized and applied. Secondly, as shown in the background of the previous topic selection, it promotes the emergence and development of Internet technology. It is famous for its rich resources and powerful functions. It emphasizes that students are the main body throughout the whole process of education and education. Multimedia network education platform provides students with a more intuitive visual and real-time interactive learning platform. These are consistent with the development and reform direction of modern education and education.

In the research of multimedia teaching and ice snow sports education, Guanhui analyzed the problems of traditional teaching methods, put forward the strategy of information teaching, and finally
elaborated the specific steps and contents of information-based teaching. He effectively improved the master's degree of radar transmitter, and laid a good foundation for the next work. His method is not accurate [1]. Di P investigates and understands the research status of teaching. Secondly, the theoretical basis and technical basis of multimedia teaching are comprehensively studied and analyzed. Finally, he verified the new multimedia system through experiments, and compared and statistically analyzed the experimental results. His method is not practical enough [2]. Zhao Y uses the methods of logical analysis, literature review analysis and professional interview analysis to analyze the traditional winter sports of Manchu nationality in northern colleges and universities. His method is out of date [3]. Da Liu used the method of questionnaire survey and mathematical statistics to investigate the students of ice and snow sports major in three sports colleges and universities. Based on the model, he designed a scale with high reliability and validity. His method is not stable [4].

This study first introduces the four advantages of multimedia network teaching, and then explains the development strategy of campus ice and snow sports education under the multimedia network teaching environment. In this study, t-test algorithm is used to measure the multimedia teaching. This study selects the ice and snow sports course teaching in some colleges and universities as the research object, analyzes the advantages brought by multimedia teaching through different teaching methods, and analyzes the popularization and growth of multimedia network teaching and the satisfaction of teachers and students to multimedia network teaching combined with the experimental results. The conclusion is that the effect of multimedia network teaching is excellent.

2. Multimedia Network Teaching and Ice Snow Sports Education

2.1. Characteristics of Multimedia Network Teaching

(1) Multimedia network education has more flexible education time

Multimedia network education adopts the latest Internet technology and multimedia technology, which breaks the limitation of traditional education time and place. As long as learners need to use computer equipment through Internet links and access to multimedia network education platform, they can control it at any time and anywhere. Learning to enable learners to adjust their learning time more appropriately [5-6].

(2) Rich educational resources of multimedia network education

Multimedia network education can fully realize global resource sharing through modern Internet technology. There are many comprehensive teaching materials on the Internet. In this way, students' thinking will be more developed. Online resources are very time sensitive. Online education resources are updated in time, and students can obtain the latest education information and the most advanced frontier knowledge in real time [7].

(3) Multimedia network education has strong multimedia characteristics

Multimedia network technology has powerful multimedia function. Multimedia technology (Multimedia Technology) provides an easy-to-use multimedia education platform through network and multimedia technology, which can display content. In addition, the analysis helps students to understand the education content intuitively, so as to strengthen knowledge learning and enable students to master rich multimedia education knowledge [8-9].

2.2. The Development Strategy of Campus Ice Snow Sports Education under the Multimedia Network Teaching Environment

(1) To formulate a plan of ice and snow sports education in accordance

At present, the foundation of ice and snow sports in China is weak, especially among young people. Ice and snow sports have not become a popular mass sport. Therefore, if we want young people to popularize ice and snow sports, we should start from the education level, introduce the ice and snow sports education into the campus, and bring the ice and snow sports into the campus. Therefore, the education functional department must judge the importance of ice snow sports education from the
perspective of policy. In order to develop a sports education plan suitable for campus ice and snow sports, an intelligent learning environment has been constructed [10].

(2) Provide high quality strength for campus ice and snow sports education

Campus ice and snow sports need a lot of professionals to educate and guide, which is conducive to specific education and educational activities. In the process of education, learning environment, the correct operation of the latest education media, compiling high-quality multimedia teaching software can provide high-quality education resources for campus ice and snow sports, and provide high-quality education resources for campus ice and snow sports teaching, which can develop education healthily and effectively [11-12].

(3) Stimulate students’ interest in participating in ice and snow sports and test teaching results

The purpose of implementing ice and snow sports on campus is to introduce ice and snow sports to youth groups, stimulate their love for ice and snow sports, strengthen participation in ice and snow sports, and improve the important part of national ice and snow sports. On this basis, summarize the content of education, modify education and education methods, so that it can be completed, so that intelligent learning. Under the environment, the ice and snow sports education on campus has made a healthy development.

2.3. Measurement Standard - T test

T-test is a very important statistical tool to test the validity of differences. The validity test of this difference is a comparison between the average values of samples, so t-test is also called average comparative analysis.

Let x obey the normal distribution n (μ, σ^2), where σ^2 is unknown. Samples (X_1, X_2, ..., X_n) Let's test the hypothesis \( H_0 : \mu = \mu_0, H_1 : \mu \neq \mu_0 \), where μ 0 is a known constant. When the variance \( \sigma^2 \) is known, the statistic is used to test the population mean

\[
U = \frac{\bar{X} - \mu_0}{\sigma/\sqrt{n-1}}
\]  

(1)

But now σ is unknown, so u can not be used as test statistic directly. In general, when the standard deviation σ is unknown, the sub sample standard deviation s is used to replace the population standard deviation, and a new statistic is obtained

\[
T = \frac{\bar{X} - \mu_0}{S/\sqrt{n-1}}
\]  

(2)

According to the sampling distribution theorem, if H0 holds, the statistic t obeys the t distribution with n-1 degree of freedom. For a given α, the critical value \( t_{\alpha/2}(n-1) \) can be obtained from the t distribution table

\[
P(|T| > t_{\alpha/2}(n-1)) = \alpha
\]  

(3)

If the calculated value t of T falls into its rejection domain \( C : |T| > t_{\alpha/2}(n-1) \), H0 is rejected.

Independent sample t-test is to compare the mean of two samples, which requires that the two samples are independent of each other, the samples are from the normal population, and the mean value is a meaningful description statistic for the test.

Let x obey the assumed normal distribution \( N(\mu_1, \sigma^2) \) and Y obey the assumed normal distribution \( N(\mu_2, \sigma^2) \), where the common \( \sigma^2 \) is unknown. Samples were extracted from the population (x1, X2, xN1) and (Y1, Y2 And the two samples were independent of each other. Now we
want to test the hypothesis \( H_0: \mu = \mu_0, H_1: \mu \neq \mu_0 \). Similar to single sample t-test, a new statistic is constructed:

\[
T = \frac{\bar{X} - \bar{Y}}{S_w \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}
\]

(4)

\[
S_w^2 = \frac{n_1 S_1^2 + n_2 S_2^2}{n_1 + n_2 - 2}
\]

are the subsample variances of the two populations. \( n_1 \) and \( n_2 \) are the number of samples respectively. If the hypothesis holds, according to the sampling distribution theorem, the statistic \( t \) obeys the t distribution with the degree of freedom of \( n_1 + n_2 - 2 \). For a given \( \alpha \), the critical value \( t_{\alpha/2} (n_1 + n_2 - 2) \) can be obtained from the t distribution table

\[
P\{|T| > t_{\alpha/2} (n_1 + n_2 - 2)\} = \alpha
\]

(5)

If the calculated value \( t \) of \( T \) falls into its rejection domain \( C: |T| > t_{\alpha/2} (n_1 + n_2 - 2) \), \( H_0 \) is rejected.

3. Multimedia Network Teaching Experiment Design

3.1. Research Data and Objects

The ice and snow sports majors in five higher vocational colleges, including Harbin Science and Technology Vocational College, Heilongjiang ice and snow vocational and technical college, and four undergraduate colleges including Harbin Institute of physical education, as well as colleges and universities offering ice and snow courses are taken as the research objects. The ice and snow courses in Colleges and universities are selected as the experimental research materials. Different teaching methods are used, and the effect of multimedia network teaching on ice and snow education is reflected through students' scores and feedback evaluation.

3.2. Experimental Design of Questionnaire Survey

(1) Questionnaire design: according to the needs of the survey, according to most relevant documents, the understanding and other aspects of teachers, ice and snow education facilities, textbooks, teachers, and pinglongjiang undergraduate sports ice and snow course students are cognitive.

(2) The objects of the questionnaire survey: 45 professional physical education teachers and 450 students were randomly selected from the Department physical education teachers who specialized in ice snow route and the public physical education teachers in Colleges and universities in Heilongjiang Provinces.

(3) The appropriateness test of the question table: in order to confirm the appropriateness of the question table, after the design of the question table, the relevant sports experts were invited to conduct a comprehensive review on the content, structure and overall design of the question list, and carry out logical appropriateness analysis.

(4) Questionnaire reliability test: in order to ensure the reliability of the survey data, test the reliability of the survey results. In order to test the stability of the questionnaire, some teachers and students adopt the "retest method". 15 days later, we investigated the same question content with the same person (15 teachers, 50 students).

3.3. Teaching Evaluation

As shown in Table 1, the basic evaluation content of multimedia network education.
Table 1. Basic evaluation contents of multimedia network teaching

| Category           | Frequency | Percentage (%) |
|--------------------|-----------|----------------|
| Teaching ability   | 40        | 100            |
| Training ability   | 36        | 90             |
| Judging ability    | 28        | 70             |
| Competitive ability| 13        | 30             |
| Innovation ability | 7         | 17.5           |
| Guidance ability   | 0         | 0              |

4. The Characteristics of Multimedia Network Teaching in Ice and Snow Sports Education

4.1. Popularization and Growth of Multimedia Network Teaching in China

According to the latest survey and statistics of China Internet Network Information Center (CNNIC), by the end of December 2019, the total number of Internet users in China has reached 564 million, with 50.9 million new Internet users nationwide, and the Internet penetration rate is 42.1%. 3.8% higher than the end of 2018. As shown in Figure 1, the scale and penetration rate of Chinese Internet users from 2012 to 2019 are shown.

![Figure 1. The growth of multimedia teaching popularization in China in recent years](image)

As can be seen from Figure 1, China has increased from 111 million in 2012 to 564 million in 2019, and the penetration rate of online education has also increased from 8.5% in 2012 to 42.1% in 2019. This obvious growth trend and penetration rate show that China has joined the ranks of Internet giants. As shown in Table 2, the penetration rate of multimedia network education in some provinces and cities of China from 2018 to 2019.

Table 2. Popularization rate of multimedia network education in some provinces from 2018 to 2019

| Province   | Network teaching (ten thousand) | Penetration rate | Growth rate |
|------------|---------------------------------|-----------------|-------------|
| Beijing    | 1459                            | 72.3%           | 5.9%        |
| Shanghai   | 1607                            | 68.5%           | 5.4%        |
| Guangdong  | 6628                            | 63.2%           | 5.3%        |
| Fujian     | 2281                            | 61.4%           | 8.6%        |
| Zhejiang   | 3222                            | 59.1%           | 5.6%        |
| Tianjin    | 794                             | 58.6%           | 10.4%       |
| Jiangsu    | 3954                            | 50.3%           | 5.2%        |
As can be seen from the survey of CNNIC's Internet users (2) in 2019, according to the survey report of CNNIC (2) on the Internet, it can be seen that the rate of Internet users published by CNNIC in 2019 is rising. It has reached 96.2%, and is now basically saturated. The penetration rate of people receiving high school education has been the highest in the past five years. In 2019, the proportion of Internet users will exceed 90%, reaching 90.8%. In today's network users, college students account for the largest proportion.

4.2. Teachers and Students' Satisfaction with Multimedia Network Teaching
As shown in Figure 2, teachers and students are satisfied with the content and method of ice and snow sports in multimedia network teaching.

![Figure 2](image)

Figure 2. Teachers and students' satisfaction with the content and method of ice snow sports in multimedia network teaching

According to the results of Figure 2, a preliminary analysis shows that 79 students are "very satisfied" with the existing education content, accounting for 18.2% of the effective respondents. The number of students accounted for 23.5%, and the number of students accounted for 23.5%. On the whole, less than half of the students (41.8%) knew or knew, and 27.3% of the total number of valid surveys (117) had doubts about the existing education content (satisfaction and dissatisfaction). 30.8% of the students thought it was "fair", but it was actually a sign of "dissatisfaction".

5. Conclusion
The full-time teachers of ice and snow lessons adopt the following teaching methods: one language explanation method, action demonstration method, practice method, prevention and error correction method. The teaching means include language explanation, action demonstration and land imitation, but multimedia and network teaching methods are rarely used. Although the use of multimedia network teaching platform in China has increased every year, the scope of application is also gradually expanding. Only by making full use of information technology to carry out ice sports teaching can we meet the needs of the future society and realize the modernization, standardization and scientization of speed skating teaching.

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