Research Article
Classroom Teaching Design of Alpine Skiing Based on Virtual Reality Technology

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Due to the limitation of venues for seasonal projects, it is a great challenge for students to adapt and maintain their sports status in non-snow seasons. Therefore, it is very important to do well in the non-snow season Lu-snow conversion training. At this stage, when the school formulates the teaching work plan for the school year, due to the limitation of the venue, the non-snow season Lu-snow conversion training is mainly based on physical training, while special skills training is supplemented, and there are problems such as poor teaching effect, insufficient teaching methods, and single practice means. At the same time, due to the reduction or even suspension of technical movement training in non-snow seasons, the teaching of alpine skiing lacks continuity and systematicity, which affects teaching effect. With the application of virtual reality technology in alpine skiing courses, this study conducts experimental research on the teaching and training effects in non-snow seasons, demonstrates the advantages of virtual reality technology in alpine skiing teaching and training, and optimizes the conversion of alpine skiing between land and snow in non-snow seasons.

1. Introduction

Skiing is a perfect combination of speed and skill. Athletes slide down hills, rely on gravity to slide down slopes from heights, and change the direction of travel by coordinating and controlling body posture. In China, alpine skiing started lately, and the development of skiing in China is slow due to the influence of natural climate and social factors. In the early days, alpine skiing was mainly distributed in northeastern China. In 1957, the first recorded skiing competition was held in Jilin City. Since then, skiing has kicked off in China. In 1980, the Chinese Winter Olympics delegation participated in the 13th Winter Olympics in Lake Placid, United States. Since then, the international exchanges of Chinese skiing have become more frequent such as the World University Winter Games, ski individual championships, World Cup, Asian Winter Games, and other international events. And in 1996, the 3rd Asian Winter Games was successfully held in Harbin and the first gold medal was won, but the alpine skiing project did not win any medals. There is still a certain gap between Chinese alpine skiers and athletes from northern Europe, the United States, Canada, and Japan in Asia in terms of physical strength and skiing skills. Therefore, it has always been the dream of Chinese skiers to improve the level of competitive ability of Chinese skiers and achieve a breakthrough in the number of medals in China’s alpine skiing events. Although there has been no breakthrough in alpine skiing competition performance, alpine skiing has been widely carried out in school sports and popular sports under the call of “300 million people participating in ice and snow sports” and the charm of the project itself. With the gradual advancement of ice and snow into the campus, many problems have also been exposed. Among them, the most prominent problems and the limitation of the venue due to seasonal projects are great challenges for students’ adaptability and maintenance of sports status in non-snow seasons. Therefore, it is very important to do a good job of transitioning from snow to snow in the non-snow season. At this stage, when the school formulates the teaching work plan for the school year, due to the limitation of the venue, the teaching plan in the non-snow season is mainly based on physical training. Special
technical training on land requires multiple comprehensive physical quality training, such as strength, speed, endurance, physical coordination, and flexibility. After entering the snow season, more training will be arranged. The long recovery training sessions are also affected by factors such as weather and funds, which affect the number of class hours in the alpine skiing season. The teaching of alpine skiing lacks continuity and systematicness, which in turn affects the teaching effect. Therefore, in the nonskiing season, how to effectively arrange ski transition training courses, strengthen the practice of technical movements, and improve the skier’s physical fitness is relatively critical. The problem of how to improve and provide physical and technical reserves for snow training needs to be solved in practice [1–8].

With the rapid development of information technology and the implementation of the education informatization reform of the Ministry of Education, the state has higher requirements for the informatization of education in colleges and universities. According to the new requirements of education reform, the characteristics and problems of alpine skiing courses are analyzed. Therefore, the simulated skiing system based on virtual reality technology is another new application hotspot of virtual reality. Due to geographical reasons, many people do not have the conditions to go out to ski or enter the ski field without training. Because when people are skiing in the field, the movement posture is mainly divided into three parameters: pitch, vertical lift, and rolling. At the same time, people will also have perception of visual changes, somatosensory temperature, and hearing. In the laboratory environment, the application of virtual reality technology enables people to enter an immersive skiing experience, thereby providing users with a real sense of skiing and allowing users to immerse themselves in the computer-generated ski simulation scene and then enjoy the process of skiing. The user’s operation on the simulation platform will also be transmitted back to the computer through the interface. On the one hand, it can provide parameters for visual changes, and on the other hand, it can interact with the simulation platform in real-time to change the user’s posture and increase the sense of immersion.

2. Related Work

At present, there are few people in China’s alpine skiing events, who are basically beginners. In teaching, they mainly focus on professional basic knowledge. There is a lack of specific practical training and operation. Especially due to seasonal reasons, beginners are often blocked from learning alpine skiing. In the project, the teaching is not systematic and the lagging factors are gradually revealed. The traditional ski theory class teaching organization is based on the class teaching system, mainly using the classroom teaching method. The teacher is the center of the teaching. In the formulation of the plan, the inherited teaching method is based on teaching, and students are always in a passive learning environment. Alpine skiing has been carried out in Northeast China since the early nineteenth century, and related teaching work has gradually sprung up. To meet the needs of the times, it can also further develop deep-level goals, cultivate students’ courage, cultivate students’ physical functions such as cold tolerance, and cultivate students’ good qualities such as perseverance, courage to break through, and tenacious struggle. Liu Jinchang proposed that traditional teaching methods such as demonstration and explanation should be used for a long time in alpine skiing teaching. The teaching methods are simple, and the bloated technical guidance can easily make students tired. How to use novel teaching methods to attract students’ interest has become another important aspect of alpine skiing teaching. Lu Jiyyong et al. proposed the combination of standardized evaluation and nonstandardized evaluation, emphasizing the importance of teachers’ “teaching” and students’ “learning” in the whole process of alpine skiing teaching evaluation. The evaluation method should be improved, and the evaluation of teachers’ ability to impart knowledge in the teaching process and students’ ability to solve problems in actual learning should be emphasized. Chi Yonghui said that the teaching time of alpine skiing is not scientific and reasonable enough, and it takes up the winter vacation time for teaching; the teaching time is arranged for 5 days a week for 3–4 consecutive weeks. Song Wenli mentioned that during the epidemic prevention and control period, the online mode of alpine skiing teaching in colleges and universities was adopted. Due to the limitations of hardware facilities, whether it was video recording or online exercise practice, it could not be effective. In response to emergencies, it is necessary to improve the teaching method of alpine skiing, improve teaching methods, enrich auxiliary exercises, and calmly deal with online teaching.

With the improvement of basic theories and technical means and the continuous improvement of users’ demands for skiing authenticity, interactivity, and real-time, a new generation of ski simulators came into being. The current ski simulator has added advanced image processing technology and later virtual reality technology on the basis of the original. As an advanced stage of the development of simulation technology, virtual reality technology is a computer simulation system that can create and experience virtual worlds. Using virtual reality simulation technology to simulate real skiing has become a research hotspot in skiing course teaching at home and abroad in recent years. In the future, the research of virtual reality technology will focus on the simulation of large-scale complex systems, which are mainly characterized by intelligent means. The development and application of virtual reality technology will break the teacher-centered class teaching form, and the teaching organization form will develop from the centralized teaching form based on the class teaching system to the classroom demonstration type, modern distance teaching, and individualized teaching. Whether in traditional teaching or modern teaching and no matter how the media changes, multimedia technology is always just a teaching method, and its auxiliary teaching status has not changed, and it will never replace the complex labor of teachers. Therefore, in the application of modern educational technology, schools and teachers cannot be denied, and the responsibilities of teachers should be strengthened rather than weakened. In order to make better use of multimedia technology to assist
teaching and improve teaching effect, ski teachers need to re-understand and adjust their roles, constantly update concepts, update knowledge, understand the latest scientific and technological achievements, and constantly master computer skills, in order to better communicate and discuss with students with the assistance of multimedia technology and play a good role as a teacher in the new situation [9–14].

3. Related Theories and Research Methods

3.1. Virtual Reality Technology. Users can observe things in the three-dimensional space in a timely and unrestricted manner and can also interact with things in the virtual world with the help of auxiliary tools such as data gloves and data clothing. When the user moves and operates, the computer can immediately perform complex tasks. It can transmit accurate three-dimensional world video back to produce a sense of presence and control the intelligent hardware to produce real-time changes in the user’s feedback on multiple channels. The technology integrates the latest research results of computer graphics, computer simulation, artificial intelligence, sensing technology, and display and network parallel processing technologies and is a high-tech simulation system assisted by computer technology. In fact, virtual reality technology is no longer limited to those wearing helmets and data gloves. In the era of rapid technological development, in-depth research on biological technology, including body surface perception technology, will accelerate the immersion of virtual reality systems. Therefore, VR technology is a technology with changing research breadth and depth. As long as the important goals of real experience and convenient human-computer interaction are met, such systems are collectively referred to as virtual reality systems. Its model representation is shown in Figure 1.

As shown in Figure 1, the user directly operates the virtual environment through the sensing device and obtains real-time three-dimensional display and other feedback information (including smell, touch, force feedback, and so on).

In a nutshell, virtual reality system is a new way for people to visualize and interact with complex data through computers. It comprehensively uses intelligent hardware technology, computer graphics technology, and so on to help the field of application to improve the experience performance. According to the different fields of application of virtual reality technology, the functions of the system are also very different. For example, flight simulator systems, aerospace field inspection simulation training systems, and so on all need to achieve different functional performance based on the overall framework. From a technical point of view, as shown in Figure 2, the virtual reality system has three basic characteristics of immersion-interaction-imagination, which emphasizes the leading role of people in the virtual system.

Immersion: this is also known as presence, refers to the real degree to which the user feels as the protagonist in the simulated environment. The ideal simulation environment should make it difficult for users to distinguish between true and false, so that users can fully devote themselves to the three-dimensional virtual environment created by the computer. And in this environment, almost all objects not only look real but other sensations including hearing, moving, smelling, and tasting are almost exactly the same as in reality, and there is a completely immersive feeling.

Interactivity: this mainly refers to the degree to which the user can operate the physical object in the virtual environment through a certain device and also includes the feedback performance obtained by the user in terms of vision and hearing through previous operations.

Imagination: this feature of virtual reality can more effectively expand people’s imagination space. Environments that do not exist in reality can be created through it, and the staff can be simulated by reproducing some dangerous environments.

3.2. Virtual Reality System Components. When the system and the external world form a feedback closed loop through the sensing device, under the control of the user, the interaction between the user and the virtual environment can have an effect on the external world (such as teleoperation and so on). The above virtual reality system is divided into six main modules, which are mainly divided into detection module, feedback module, sensor module, control module, modeling module, and 3D module, as shown in Figure 3 [15].
3.2.1. Detection Module. User’s operation instructions are detected; tools such as data gloves, data clothes, trackers, helmet-mounted displays, and other devices are detected and acted on the virtual environment through the sensor module.

3.2.2. Feedback Module. After receiving the information from the sensor module, it provides real-time feedback to the user.

3.2.3. Sensor Module. On the one hand, it receives the operation instructions from the user and acts on the virtual environment.

3.2.4. Control Module. The sensor is controlled to make it work on the user, the virtual environment, and the real world.

3.2.5. Modeling Module. A three-dimensional representation of the real-world components is obtained and the corresponding virtual environment is formed.

3.2.6. 3D Module. 3D models are created independently or 3D data of various components of the real world through on-site framing and other means are created, and then their 3D models are built.

3.3. Application of Virtual Reality Technology in Alpine Skiing Yundang Course. The combination of virtual reality technology and motion simulator was first applied in flight driving. With the rapid development of computer technology, the performance of computer systems is getting better and better and the price is falling. Now, the performance of PCs has surpassed that of the early days. The use of virtual reality technology in ski simulation systems is also more common. The application of VR technology can not only popularize knowledge about skiing and other ice and snow sports to the greatest extent but also facilitate operation, short training time, and low cost. The designed ski sports platform is used for training. When the experience personnel operate the foot sensors and so on, the information output from these interfaces will be input into a graphics system, and the graphics system will mix and program these information and then display the experience personnel. Scene interaction can be achieved through virtual 3D skiing scenes. Experiencers wear VR glasses, and their eyes will show images corresponding to the outside world. After that, whenever the human body posture changes and the display changes the viewport, the visual rendering module will continuously render the virtual scene model (such as ski tracks, mountains, and other transportation facilities) through the camera. [16–18]. Therefore, the ski simulator system based on virtual reality technology greatly improves the immersion, interactivity, and conception of the system. It provides users with a more realistic skiing environment and provides a good visual operation platform for various applications such as skiing training.

4. Design and Implementation of Teaching Experiment of Alpine Skiing Course under Virtual Reality Technology

4.1. Experiment Design of Alpine Skiing Course under Virtual Reality Technology. In this study, virtual reality technology was introduced into the teaching of land simulation exercises in non-snow seasons, and an experimental class and a control class were designed. On the basis of a comprehensive understanding of the key points and difficulties of the alpine skiing beginner course, the training content of the alpine skiing course is designed, and the virtual reality technology alpine skiing sports course teaching and the traditional land simulator teaching are combined. The weight, difficulty, and error-prone points of teaching are carried out with targeted training on land simulators in the non-snow season. Therefore, when designing the teaching content of the compulsory alpine skiing courses, the teaching focuses on these two aspects and reduces the energy in other courses as appropriate. Therefore, this paper introduces virtual reality technology on the basis of traditional physical training in non-snow seasons and designs related exercises to conduct intervention experiments on the compulsory alpine skiing class, which can be divided into the following three stages:

The first stage is the physical training stage that must be carried out in each class. In the non-snow season, the key part of the teaching is physical training. Only when a large amount of physical fitness is accumulated in the non-snow season, can the technical training in the snow season be handy and improve learning efficiency. The second stage is the adaptation stage of skiing. This stage mainly includes basic skiing techniques such as straight downhill, plow downhill, and plowdown stop. It is impossible to learn any technique by bypassing this stage of learning because these techniques are all basic techniques. Because beginners have poor speed control ability on skiing, if they directly practice on the snow, it will easily lead to fear of beginners when they learn the first step of skiing skills, which is not conducive to further learning in the later stage. At the same time, the learning at this stage can greatly improve the beginner’s control ability and center of gravity control ability. The center of gravity is backward, it is not convenient to control the board head, and the center of gravity is unstable and easy to fall; the center of gravity is
forward, and it is not convenient for the whole body to coordinate force [19].

The third stage is to learn a series of applied basic exercises such as inclined downhill, lateral downhill, and plow turns. This stage is the introductory technique for alpine skiing. Taking plow turns as an example is both the key and the difficulty for beginners. Therefore, it is necessary to master this technology as much as possible in the land simulation training stage, so as to carry out high-level learning in the snow season training. The biggest problem that students face when learning to ski is that they cannot control the sliding speed well, and the mastery of the plow turning technique ensures that students can effectively control the sliding speed during the sliding process, including the plow sliding technique, which can control the acceleration during the sliding to a uniform speed. Deceleration movements can also be used to stop, which is the basis for further learning, and the practice of these techniques can be realized in virtual reality technology, while observing their own movements and listening to the teacher’s correction.

4.1.1. Experimental Assumptions

Hypothesis 1. The introduction of virtual reality technology alpine skiing courses into alpine skiing onshore simulation training can allow students to learn and master alpine skiing techniques more efficiently and improve learning efficiency within a limited number of hours.

Hypothesis 2. Introduce the virtual reality technology alpine skiing onshore simulation training, promote the improvement of the teaching effect of the alpine skiing course, and ensure the improvement of the teaching quality [20].

4.1.2. Purpose. The virtual reality technology alpine skiing course is applied to the compulsory alpine skiing course, and two classes are selected as the experimental class and the control class with different teaching plans. In the non-snow season alpine skiing teaching and training, the control class conducts traditional land teaching training, and the experimental class introduces virtual reality technology alpine skiing sports course on the basis of traditional land training, obtains data through experiments, and compares the experimental class through mathematical statistical analysis. The difference between the data of the control class and the virtual reality technology alpine skiing exercise course can be obtained.

4.1.3. Experimental Variable

(1) Independent variables: the independent variables in the experiment are two different forms of teaching methods; that is, the control class uses traditional teaching methods to conduct ski land simulation training, and the experimental class uses virtual reality technology to conduct ski land simulation training.

(2) Dependent variables: dependent variables are sliding technical evaluation and skating time scores.

(3) Control of irrelevant variables: in order to ensure the homogeneity of the experimental samples, two classes were tested for physical fitness before the experiment, and the data were statistically processed to see if the levels of the two classes were consistent. At the same time, students with skiing foundation will be excluded from the list of experimental data statistics, and they will take classes normally but not participate in the experimental data statistics.

4.1.4. Post-Experiment Test Results and Analysis. The slalom gliding time is evaluated from the angle of slalom gliding in order to verify the influence of the virtual reality technology alpine skiing course on the teaching effect of alpine skiing. The test site is set on a snow track with a length of 200 meters and a slope of 15–20 degrees, and the number of flag gates is 12. The rules of this test are implemented in accordance with the rules of the alpine skiing competition. The students set off in sequence and take the test once. Three teachers use the hand timer to count the scores. The average of the three scores is the final score. If it is judged that the foul score is invalid, it may not be tested once, but 20 points should be deducted from the score obtained [21, 22].

The technical evaluation of sliding is to verify the application effect of the virtual reality technology alpine skiing course from the perspective of the evaluation of slewing technology. Three teachers from the Alpine Skiing Teaching and Research Office were invited to evaluate the students’ turning skills, and the average of the three teachers’ scores was calculated as the student’s technical score. Slalom technical evaluation results: the examiners refer to the technical evaluation rules of the giant slalom and use a 100-point scoring system. If the candidate has missed the door in the process of turning and sliding, it will be judged that the foul result is invalid. Candidates whose time is more than 45 seconds will receive 0 points for their skills specifically as shown in Table 1.

4.2. Implementation of Alpine Skiing Courses under Virtual Reality Technology

4.2.1. Experimental Course Arrangement. The experimental class and the control class are divided into classes. In order to ensure the rigor and reliability of the experiment, the difference between the teaching plan of the control class and the experimental group is only one factor of virtual reality technology, alpine skiing, and two factors, such as teachers, venues, and equipment. At the same time, in order to ensure the validity of the experiment, the students in the two classes were tested for physical fitness before the experiment, in order to reduce interference factors and ensure that the experimental data were more comparable and more feasible. The details are shown in Table 2.
4.2.2. **Teaching Method Experiment Process.**

The control class 1 adopts the experimental teaching method, and during the experiment, it adopts the traditional teaching plan in the non-snow season + the alpine skiing teaching mode in the snow season. The first 9 hours are traditional land-based simulation training in the non-snow season, where teachers explain and demonstrate and students practice imitation. The first step is to announce the teaching content and learning tasks of this class; the second step is general physical training, special physical training, and special physical training; the third step is land training for special skills of alpine skiing, and the teacher performs technical movements on land. The focus is on explaining the main points of the movements. Students imitate the teacher’s technical movements, experience the force points and the order of force, and practice repeatedly according to the main points of the movements. Teachers observe and correct in time when students practice and organize unified explanations and guidance when dealing with common problems.

Then, the new technical movement is explained and the above teaching steps are repeated. The final step is post-class evaluation and summary.

Experimental class teaching method and experimental process: the experimental class 2 also adopts the traditional teaching plan in non-snow season + the teaching mode of alpine skiing on snow in snow season. On the basis of the traditional land practice plan of alpine skiing, virtual reality technology is introduced for teaching, and the teacher’s explanation and demonstration are still used. Students imitate exercises. In the same way, in the first step, the teacher will first talk about the teaching content and teaching tasks of the announced class; the second step will be general physical training and special physical training, and the experimental class will join the special physical training of alpine skiing combined with virtual reality technology. The special skills training is divided into land training and virtual reality technology alpine skiing training. First, the teacher will explain and demonstrate the movements on land, and

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### Table 1: Technical evaluation rules for giant slalom.

<table>
<thead>
<tr>
<th>Grade (point range)</th>
<th>Evaluation standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent (100–86 points)</td>
<td>The control ability of the basic sliding posture of the rotation is good, the rhythm of the center of gravity and the timing of the rotation are well coordinated, the movement of the center of gravity and the strength of the blade are good, and the technique of controlling the speed and the rotation arc is well used.</td>
</tr>
<tr>
<td>Excellent (85–76 points)</td>
<td>The ability to control the basic sliding posture of the giant slalom is good, the rhythm of the center of gravity and the timing of the rotation are well coordinated, the transfer of the center of gravity and the strength of the blade are good, and the technique of controlling the speed and the turning arc is well used.</td>
</tr>
<tr>
<td>Excellent (75–60 points)</td>
<td>The basic sliding posture of the slawing has a certain ability to control, the extension of the center of gravity and the timing of the rotation are better, the movement of the center of gravity and the strength of the blade are better, and the technique of controlling the speed and the arc of the rotation is better.</td>
</tr>
<tr>
<td>Poor (less than 60 points)</td>
<td>The ability to control the basic sliding posture of the slawing is poor, the coordination between the rhythm of the center of gravity and the timing of the rotation is poor, the movement of the center of gravity and the strength of the blade are poor, and the technique of controlling the speed and the turning arc is poor.</td>
</tr>
</tbody>
</table>

### Table 2: The comparison of curriculum arrangement of the control class and the experimental class.

<table>
<thead>
<tr>
<th>Lessons</th>
<th>Control class</th>
<th>Experimental class</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Basic strength training class (land)</td>
<td>Basic strength training class (land)</td>
</tr>
<tr>
<td></td>
<td>Sliding basic posture (land imitation practice)</td>
<td>Basic sliding posture (virtual reality alpine skiing)</td>
</tr>
<tr>
<td></td>
<td>Flexibility training class (land)</td>
<td>Flexibility training class (land)</td>
</tr>
<tr>
<td>2</td>
<td>Teaching without a snowboard, teaching with a single snowboard, teaching with a pair of snowboards (land imitation practice)</td>
<td>Teaching without snowboard, teaching with single snowboard, teaching with double snowboard (virtual reality technology alpine skiing)</td>
</tr>
<tr>
<td></td>
<td>Explosive training class (land)</td>
<td>Explosive training class (land)</td>
</tr>
<tr>
<td>3</td>
<td>Straight downhill technique, straight downhill assist practice technique (land imitation exercise), balance and agility training session (land)</td>
<td>Straight downhill technique, straight downhill assist practice technique (virtual reality alpine skiing), balance and agile training session (land)</td>
</tr>
<tr>
<td>4</td>
<td>Plow downhill technique (land imitation exercise), core strength training class (land)</td>
<td>Plow downhill technique (alpine skiing with virtual reality technology), core strength training class (land)</td>
</tr>
<tr>
<td>5</td>
<td>Plow downhill technique (land imitation practice)</td>
<td>Plow downhill technique (alpine skiing with virtual reality technology)</td>
</tr>
<tr>
<td>6</td>
<td>Aerobic endurance training class (land) plow turn technique (land imitation exercise), flexibility training class (land)</td>
<td>Aerobic endurance training class (land) plow turn technique (virtual reality technology alpine skiing), flexibility training class (land)</td>
</tr>
<tr>
<td>7</td>
<td>Plow turn breakdown instruction (land imitation exercise), balance and agility training session (land)</td>
<td>Plow turn decomposition instruction (alpine skiing with virtual reality technology), balance and agility training session (land)</td>
</tr>
<tr>
<td>8</td>
<td>Slope downhill technique and half-plow turning technique (imitation practice on land)</td>
<td>Slope downhill technology and half-plow turning technology (virtual reality technology alpine skiing)</td>
</tr>
<tr>
<td>9</td>
<td>Snow alpine skiing basic technical training</td>
<td>Snow alpine skiing basic technical training</td>
</tr>
</tbody>
</table>
the students will imitate the teacher’s movements. Then, the teacher will demonstrate the movements in the virtual reality technology alpine skiing, and the students will imitate and practice. Also, in the whole process of special technical practice, the focus of the teacher’s explanation is on the main points of technical movements. Students imitate and practice according to the main points. Students observe their movements through a single-sided mirror and correct them in time. When students practice, teachers should observe students’ movements, correct them in time, and organize unified explanation and guidance when dealing with common problems. Then, the new technical movement is explained and the above teaching steps are repeated. The final step is post-class evaluation and summary [23, 24].

4.3. Research Results and Analysis

4.3.1. An Empirical Study on the Effect of Virtual Reality Technology on Skiing Teaching. In order to verify the impact of the introduction of virtual reality technology on the teaching effect of alpine skiing courses in non-snow seasons, I conducted an empirical study on two selected classes by using the comparative experiment method. The experimental class introduced virtual reality technology for teaching, and the control class adopted traditional teaching methods. The experimental results show that the experimental class can enable students to learn and master alpine skiing techniques more efficiently within a limited period of time, improve learning efficiency, promote the improvement of the teaching effect of alpine skiing courses, and ensure the improvement of teaching quality. In order to verify the teaching effect of the two classes, after 9 class experiments, the technical learning of the students in the two classes was assessed in the last class, and the test scores were processed using statistics. The statistical results are shown in Table 3.

From Table 3, it can be seen that the experimental group is better than the control group in terms of both the skating technical evaluation performance and the skating time performance, and the highest score, the lowest score, or the average value is better than the control group. Through the independent sample T test, the P values were all less than 0.05, indicating that there was a significant difference in the scores of the two classes. The main difference between the two classes is the difference in teaching methods. The experimental group introduced virtual reality technology in the teaching, giving full play to the advantages of virtual reality technology in simulation training on the road in the non-snow season and introducing the learning of various skiing techniques to the alpine skiing land. In the simulation training, it is used to simulate the ski field to assist students in learning technical movements. Students use the single-sided mirror in front of them to observe their technical movements. At the same time, the instructor corrects wrong movements next to them. Understand your own mistakes and correct them in time, establish skiing technical movements in a short time, strengthen students’ learning efficiency, and promote students’ understanding and mastery of skiing skills. However, the traditional land simulation training can only carry out simple imitation exercises on land, which cannot make the students fully experience the feeling of sliding on the snow, the imitation exercises are less effective, and the learning efficiency is low. Therefore, the comparison of the results of the experimental group and the control group can show that the introduction of virtual reality technology in the non-snow season onshore simulation training can promote students’ mastery of the technology, and the learning efficiency is better than the traditional teaching method. Through repeated practice, students’ understanding of sports technology can be strengthened, and students’ basic skills can be more solid. Therefore, the introduction of virtual reality technology is more conducive to the mastery of skiing skills and actions and promotes students’ further learning in the snow season.

4.3.2. Questionnaire Survey and Analysis of the Influence of Virtual Reality Technology Teaching on Teaching Effect. In order to further understand the students’ feelings of using virtual reality technology, a questionnaire survey was conducted on the students’ learning feelings after the experiment, and the anonymous method was adopted to increase the feasibility of the questionnaire.

From Table 4, it can be seen that 100% of the students believe that virtual reality technology teaching can improve their learning enthusiasm, and virtual reality technology should be introduced in the non-snow season alpine skiing teaching to improve learning efficiency. 93% of students believe that the introduction of virtual reality technology in skiing technology teaching is more practical and can promote the understanding and mastery of skiing technology. Compared with traditional land simulation training, virtual reality technology can fully restore the feeling of sliding on snow. It is beneficial for students to learn skiing skills and movements and improve their learning efficiency.

5. Conclusion

Due to the natural environment and the limitation of teaching venues, the teaching time is short. In the non-snow season, there are mainly alpine skiing theory courses and non-snow season land-snow conversion training courses. In the non-snow season, the land-to-snow conversion training courses are mainly in general and special physical training. Affected by environmental conditions, there is less practice of alpine skiing skills. At present, the teaching content of skiing in non-snow season land-to-snow conversion training is mainly based on physical training, and the teaching method is relatively simple and imperfect, and many aspects need to be strengthened, which cannot meet the needs of the society for the development of ski talents. There is a weak sense of innovation in snow transition training, and the teaching content is mostly traditional physical training methods, and the content is relatively boring and monotonous. This study examines the influence of the introduction of virtual reality technology into the non-snow season land-
snow conversion training on the teaching effect of alpine skiing courses. On the basis of experimental research, the relationship between the key and difficult points of alpine skiing teaching and virtual reality technology and the advantages of virtual reality technology in skiing teaching are comprehensively analyzed. Through the research of this paper, it is concluded that

1. The results of the teaching experiment show that the introduction of virtual reality technology into the alpine skiing course has a significant effect on improving the learning efficiency and learning quality and effectively improves the teaching effect. Its advantages are mainly manifested in which it is conducive to stimulating students’ interest in learning, simulating snow tracks to provide students with an intuitive teaching environment, and adjusting the slope and speed, is conducive to teaching students according to their aptitude, and is conducive to mastering the key points of skiing techniques and consolidating the foundation for snow teaching.

2. The introduction of virtual reality technology into alpine skiing teaching has important practical significance and value, which is mainly reflected in the change of teaching venues, the simulation of real skiing experience in non-snow seasons, and the timely implementation of students’ practice movements through a single-sided mirror. The feedback is given to the students, which is conducive to the mastery of the students’ standard movements.

**Data Availability**

The dataset can be accessed upon request.

**Conflicts of Interest**

The author declares that there are no conflicts of interest.

**References**


