

# Analysis on Computer Virtual Reality Technology and Research on Its Application in College Teaching

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**Abstract:** purpose: discuss and analyze sport physical teaching of the computer aided teaching (CAI) under the artificial intelligence information environment; Method: introduce the basic composition of the computer aided teaching, conduct detailed analysis on CAI strengths and weaknesses, introduce the concept of intelligent computer aided teaching (ICAI) based on it, and investigate and analyze the undergraduate teaching conditions of 8 colleges such as Beijing Sport University by using the information query method, expert interview method, expert scoring method and investigation method by combining the early survey and research. Result: The investigation results display that the ICAI use of colleges improved remarkably. The average annual growth rate is about 8%. The ICAI satisfaction of the teachers and students is over 85%. Conclusion: ICAI is one brand-new pattern in the modern education teaching and is also one attempt, which should be guided and studied by related experts and scholars in future application.

**Keywords:** Algorithm, artificial intelligence informatization, computer aided teaching, intelligent computer aided teaching, expert interview method, expert scoring method and brand-new pattern.

## 1. INTRODUCTION

With quick development of modern technology, multimedia computers are used in more and more education fields. Since 21th century, the human being society completely strides into the information age. The human being not only captures the knowledge via pure text, but also captures knowledge via the modern information technology with the multimedia and network technology as the core. This modern technology can integrate multiple media technologies such as sound, images and videos and combine multiple information transmission channels such as Internet technology, virtual reality technology and communication technology, so it quickly spreads in the whole human being [1]. In 2012, Dean Luo Wen from China Electronics Information Industry Development Research Institute pointed out “the information technology is the most innovative, most active and quickly influencing key technology and is the key engine to promote economy growth and knowledge communication and application. Now, the technology achievements with the new-generation information technology as the representative is transforming to the realistic productivity at the unprecedented speed, which will deeply affect and change production mode, living mode and thinking mode of the human being [2]” in “2010 China IT market annual conference”.

The computer assisted teaching (CAI) indicates different computer aided teaching activities and methods and technologies for discussing teaching contents with students, scheduling teaching process and training teaching via dialog.

Generally it is divided into computer hardware, system software and course software. CAP provides a better personal learning environment for students. The CAI provides a better personalized learning environment to students, which integrates computer technologies such as multimedia, hypertext, AI, network communication and knowledge library and overcomes the weakness of singleness and incompleteness of traditional teaching and scenario mode. CAI can effectively shorten the learning time and improve the teaching quality and teaching efficiency and realize the optimal teaching target. The computer aided teaching is a complicated system engineering. A uniform standard should be prepared and obeyed in design and development to ensure system scalability. The data coding standard or specification of the national standard computer aided teaching should be established. Teaching application software development and construction specification should be prepared. Development and construction of the teaching application software system should be standardized to ensure organic integrated of applications [3, 4].

The artificial intelligence indicates machine thinking and a new technology science to simulate, extend and expand human being intelligence, including theories, methods, technologies and application system. The word “artificial intelligence” was proposed in Dartmouth academy in 1956. Since then, the researchers have evolved many theories and principles. The concept of the AI is subsequently extended [5]. Development of the multimedia technology depends on improvement of the existing science technology level. The AI informatization results from the modern science technology. Its development is restricted by development of computer and multimedia technology. AI also potentially affects development of computer level and multimedia technology.

Increasing development of AI informatization and combination with other leading technologies can drive efficiency development of the computer aided teaching CAI. This paper studies sport education and several development prospects of the sport computer aided teaching CAI under the AI informatization environment in order to deeply mine the deep influence of the AI informatization on the sport computer aided teaching CAI and guide feasible thinking.

## 2. CURRENT CONDITIONS AND EXISTED ISSUES OF COMPUTER AIDEDSPORT TEACHING SYSTEM

In recent years, with improvement of the computer level, the computer aided teaching system also evolves in colleges in China. Compared to the traditional teaching system, the computer aided teaching not only provides high-quality text and image teaching, but also gives students brand-new teaching idea via the sound, animation, video and virtual reality. This multi-dimension teaching mode is quickly recognized by many colleges and quickly evolves in a short period. For sport teaching, although the computer aided teaching does not reach recognition and applicability, the computer aided teaching has its uniqueness in sport teaching [6].

1) The computer aided sport teaching system can provide very real and expressive teaching contents to sports students or sports lovers.

2) The computer aided sport teaching system can improve passion of college students to the sport leaning and improve learning efficiency of sport skills;

3) Facilitate diversity of sport teaching mode;

4) Provide unique teaching;

5) Record learning effect, evaluate students and teachers, and provide feedback to sport teaching.

Based on the above analysis, the computer aided sport teaching system can provide highly real, diversified and intelligent teaching mode. With this system, students can design a proper teaching mode according to different level of the recognition sport skills. The teaching abandons the whiteboard teaching policy of teachers or tutors. Students can get contents of the sport teaching from multiple views.

Certainly, although the computer aided teaching system is extensively applied and gets publically recognized teaching effect, however, we can also easily discover many problems to solve in the computer aided teaching system.

1) Be lack of human-machine interaction capability, intelligence and teacher and student interaction capability. The assisted system is separated from practice operations in the existing computer aided sport teaching, so it generates the problems such as lack of AI and human-machine interaction evolution.

2) Insufficient emphasis. Although the colleges has a computer aided sport teaching system in studying and survey, it is not emphasized by tutors or teachers. Half teachers still sticks to the oral teaching.

3) The theory learning contents of sport courses are superficial. The involved computer aidedteaching contents are

vague or pursue for sensory stimulus in many indoor teaching (theory teaching). Such teaching contents will not motivate student's thinking. On the contrary, it will affect teaching effect of the computer aided teaching and student's attention.

4) Partial sport teachers have worse cognition on the computer aided teaching. This issue is extensive in investigation, especially some old teachers have worse capability of accepting fresh things, so they have worse cognition on the computer aided teaching, even contradict the computer aided sport teaching.

5) The teaching contents deviate from the practice capability severely. We find that many colleges teach difficult sport actions in theory teaching via investigation. However, the practice cannot reach the level of the theory teaching. Such armchair actions still exist in many colleges.

6) The computer aided teaching system features stronger generality and weaker uniqueness.

On the whole, the computer aided teaching includes many issues. Most issues are caused by history reasons, slow development and imperfect talent teams. The application of computer aided teaching in sport teaching should be improved from multiple aspects, especially training and teaching content management for middle-aged and elder teachers.

## 3. INTELLIGENT COMPUTER AIDED TEACHING SYSTEM

The traditional computer aided teaching exists in a standalone manner, namely singular present teaching contents and teaching courseware. Theory teaching contents are lack of intelligence feature and modern communication means, so it can not realize the human-machine interaction and individualized teaching scheme, so CAI can not truly meet early modern teaching requirements. The computer aided teaching system based on AI is generated.

The intelligent computer aided instruction (ICAI) is a mainstream trend of CAI, which is the resultant of the AI and CAI combination. The intelligent computer aided teaching system studies "human being" and is a new education technology, which combines multiple subjects such as computer technology, AI technology, artistic gym and art subject and education psychology based on the human being cognition and thinking process as the theoretical foundation. ICAI is based on the idea that the "teaching and learning" is the thinking process based on "human being", namely find learning and cognition process via the learning and thinking process of human being. ICAI can provide highly adaptive learning method to students. With ICAI, students can quickly, directly and simply learn and cognize new things such as new gym skills and new basketball fitting tactics.

Compared to CAI, ICAI has the following features [7]:

1) It can automatically generate the problems and excises suitable for learner's degree;

2) Select learning contents and adjust the teaching process according to different level and learning conditions of students.

- 3) Understand teaching contents and explain and consult it;
- 4) Generate and understand natural language to realize free teaching problem system and improve proactivity of the courseware in human-machine interaction;
- 5) Diagnose student errors, analyze error reasons and take corresponding correction measures;
- 6) Continuously improve teaching strategies in teaching;
- 7) Evaluate learning behavior of students.

Not all intelligent teaching aided systems have the above features. For the ICAI aided sport teaching system, adaptability, diagnosis and error correction and evaluation system are distinct. Tutors or students can prepare personalized teaching schemes according to their learning capabilities (adaptability), learn and exercise via human-being interaction, diagnose problems in practices such as gesture and actions, and give comprehensive technology evaluation for each student and tutor via repeated teaching practices.

With undergraduate education of 8 sport colleges such as Beijing Sport University, Shanghai Institute of Physical Education, Shenyang Institute of Physical Education, Xi'an Institute of Physical Education, Capital Institute of Physical Education, Chengdu Institute of Physical Education, Wuhan Institute of Physical Education and Guangzhou Institute of Physical Education as the research objects (8 colleges use ICAI system to aid sport teaching subsequently), the course setup and indoor teaching contents of 8 colleges are investigated and analyzed via the reference method, expert interview method, investigation method (network survey and questionnaire) and logic analysis method. The analysis results are shown as the Figs. (1) to (4).

Remark: BSU indicates Beijing Sport University, SIPE is Shanghai Institute of Physical Education, SyIPE is the Shenyang Institute of Physical Education, XIPE is the Xi'an Institute of Physical Education, CIPE is the Capital Institute of Physical Education, CdIPE indicates Chengdu Institute of Physical Education, WIPE indicates Wuhan Institute of Physical Education and GIPE indicates Guangzhou Institute of Physical Education.

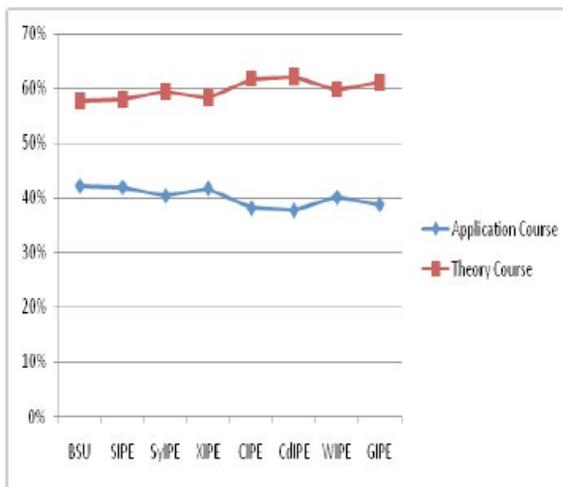


Fig. (1). Compulsory theory courses and application course distribution diagram of colleges.

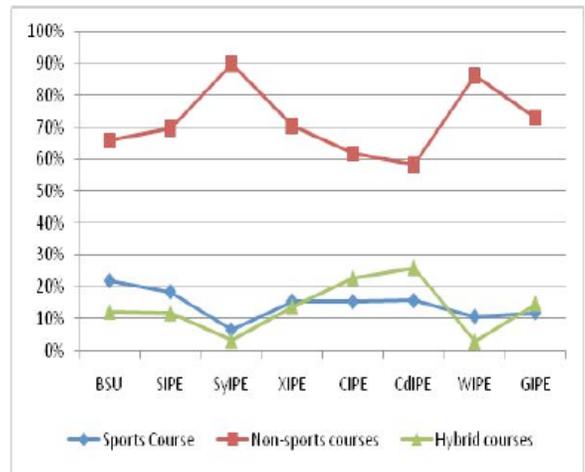


Fig. (2). College compulsory course distribution.

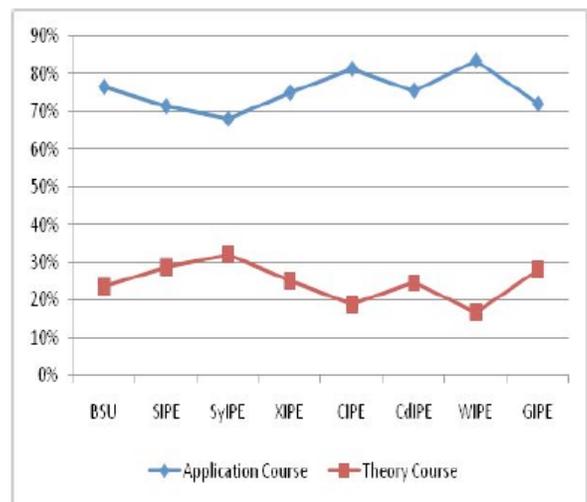


Fig. (3). Optional theory courses and application course distribution diagram of colleges.

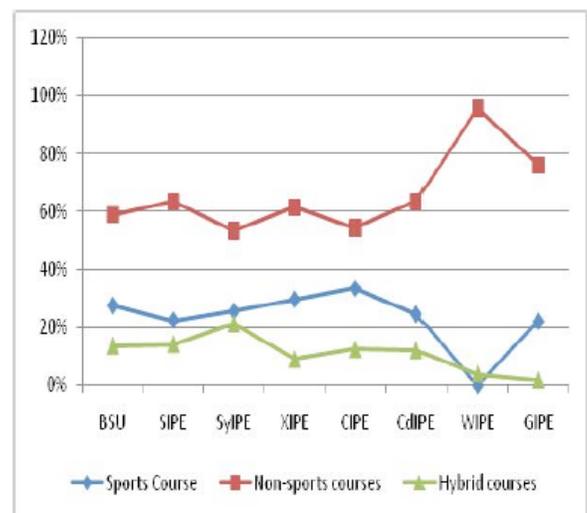


Fig. (4). Optional course type distribution of colleges.

From the Figs. (1) to (4), we can find that the compulsory courses focus on theory in the college sport courses and its total percent is 61.24%, which is 20% higher than it of the

application courses. For the optional courses, the percent of application courses increase obviously and is about 75.38% of total courses. For the compulsory course, the percent of theory courses decreases by 36.63%. Based on the course type distribution survey and analysis of colleges, we can find that the sport courses are less. The sport courses are 19.14% and 23.24% of total courses in the compulsory courses and optional courses. For non-sport courses, the percent of the non-sport courses or sport aided courses is higher. The intermediate courses mainly include the foundational courses such as politics and English, which will be discussed in details.

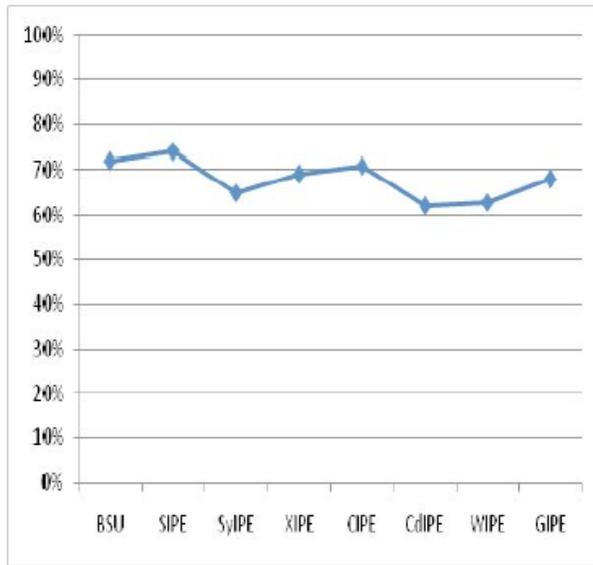


Fig. (5). Percent of ICAI aided sport teaching.

In addition, this paper counts the percent of ICAI aided sport teaching method based on a large number of references. The statistics results are shown as the Fig. (5). The ICAI satisfaction of the students and teachers in colleges are investigated by using the investigation method and export score method. The investigation results are shown as the Fig. (6).

The Fig. (5) indicates that ICAI application percent in sport teaching is between 60% and 75% for the investigated 8 colleges. The mean use rate is 68.5%. The maximum use rate is 73.5%. The Chengdu Institute of Physical Education has the minimal 62.1%.

The statistics results indicate that the use percent of CAI based on AI increases by 32.4% in sport teaching compared to 2010 (the teaching percent is 36.1% in 2010), so the CAI based on AI evolves quickly and the average annual growth rate is about 8%. The satisfaction investigation displays that ICAI satisfaction of teachers is slightly higher than it of students. The average score of teachers is 90%. The student score is 88.9%. Teachers may have deeper understanding via ICAI training and operation in teaching system reconstruction compared to students. In addition, the students have shorter contact time with ICAI and narrower contact field, but the satisfaction of ICAI can reach 88.9%, so the role of ICAI is higher in college teaching.

CONCLUSION

From the above investigation and discussion, we can find that continuous application of computer aided teaching in different teaching creates a new thinking for sport teaching. The sport aided teaching is still on the initial attempt phase, especially the CAI aided sport teaching is welcomed by extensive teachers and students in a short period under the AI informatization environment. ICAI aided sport teaching has valuable role. Compared to traditional sport teaching, ICAI can provide high-quality teaching service and more perfect teaching scheme to students and add learning enthusiasm of students. With effective independent learning, adaptation, diagnosis and error correction, students can shorten theory and practice teaching time, so ICAI is one of very effective teaching means to optimize sport teaching. However, ICAI aided sport teaching is still on the preliminary research phase.

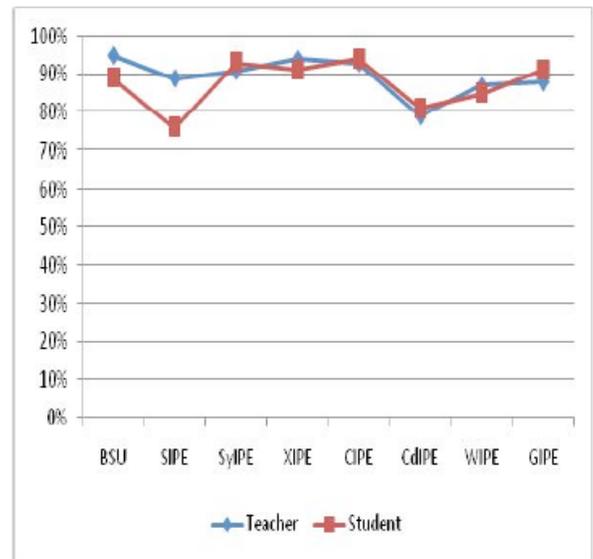


Fig. (6). ICAI satisfaction investigation results.

and has many problems to solve or improve, e.g. ICAI popularity is low and many colleges use traditional teaching pattern in many courses. The programs developed for practice steps are few and the use rate of virtual reality technology is low, so ICAI aided sport teaching is restricted. The author believes that ICAI will be further improved with continuous development of the network technology and virtualization technology. The modern teaching means is an intelligent teaching pattern. The CAI teaching is a mainstream teaching pattern. The AI informatization environment will gradually and quickly evolve under the current teaching institutions and conditions. CAI aided sport teaching will be emphasized and evolve under AI environment.

CONFLICT OF INTEREST

The author confirms that this article content has no conflict of interest.

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