Research on Fast Feedback System of Physical Education Teaching Based on Computer Digitization

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Abstract. In the process of physical education, the market is accompanied by the transmission of information, that is, the interaction between teachers and students. The quality and speed of feedback can reflect the quality of teaching from the side. This article relies on computer digitization technology and takes basketball teaching as an entry point. By constructing a feedback system that contains models of students' real movements and game performance, the use of rapid feedback enables students to see students' movements, coordination, and cooperation in time, and get teachers' advice. Quick guide. The system enables students to quickly grasp the key points of technical and tactics, which is conducive to correcting wrong actions.

Keywords: Physical Education. Computer Digitization, Fast Feedback

1. Introduction
Any control must be carried out through information feedback¹-². The physical education process is accompanied by information transmission, so its operating mechanism also reveals the law of movement of teaching information in the system. Generally, after the information output in the system is applied to the controlled object, the effect produced is transmitted back, and the process of affecting the output of the information is called feedback control. It refers to the system and its development process according to certain conditions and predetermined goals. Influencing actions, the system that exists in the control process is the control system³.

Some scholars pointed out that my country's sports training technology is relatively low, and subjective and experience-based teaching is mostly adopted⁴. Coaches guide the athletes with their naked eyes and experience, and athletes master technical essentials through a large number of repetitive exercises, which have seriously affected the improvement of my country's sports level; in terms of the internal laws of basketball and the understanding of the participants in this sport, Video and animation are the most important media⁵-⁶. Video analysis software is frequently used in NBA and CBA professional team training games, and it is used in professional sports schools and some CUBA teams. However, the basketball special teaching of physical education majors in ordinary colleges and universities is used less or only at the level of video playback, which is far from playing the powerful functions of video analysis software.

Relying on computer digital technology, this article attempts to build a fast feedback system suitable for the teaching characteristics of physical education majors in ordinary colleges and
universities in order to improve the quality of teaching.

2. The basis for building a fast feedback system for multimedia video library

2.1. System construction process
The basketball special teaching of physical education major generally consists of techniques, tactics, competitions, refereeing, practice and other links, and each link is interspersed and blended in the teaching process. The multimedia video library fast feedback system is designed according to the teaching characteristics of the specialty. The specific process is shown in Figure 1.

![Figure 1. The construction process of the multimedia video library fast feedback system.](image)

2.2. Required software and hardware
"The Analects of Confucius: Wei Linggong Pian" says: "Workers must first sharpen their tools if they want to do well." The software and hardware used in this research determine the quality of the feedback video. See Table 1 for specific software and hardware.

| Stage                  | Hardware                  | Software                                      |
|------------------------|---------------------------|------------------------------------------------|
| Video capture          | Digital camera            | Video site                                    |
| Video processing       | Ordinary computer         | Format Factory, Picture Sound Picture Shadow X4, Photoshop CS, basketball playbook, Macromedia flash 8 |
| Video library construction | Ordinary computer, mobile hard disk | All My Movies                                |
| Video feedback         | Ordinary computer         | QQ group file                                 |

It can be seen from Figure 1 and Table 1 that the multimedia video library fast feedback system consists of four links: video collection, video processing, video library construction, and video feedback. Video collection is mainly based on classroom videos and Internet downloads; video processing mainly uses the software listed in Table 1, combined with the needs of teachers and students for specific effects processing; the software "All My Movies" is used to complete the construction of the video library, so that video files can be processed according to multiple themes Fast retrieval, sorting, extraction, playback and other functions; video feedback through QQ group files, the processed video and animation materials are fed back to students, and corresponding homework requirements are put forward.

3. Construction method of fast feedback system for multimedia video library

3.1. Video capture
Network video capture. Relying on the computer network and other video websites to search and
download related videos required for the basketball special teaching of physical education majors. Due to the level of the students' overall level and individual differences, training needs in different locations, etc., the downloaded videos need to be simply screened and classified to facilitate the construction of the video library. For example, team training, individual training; offensive and defensive training; technical training in different positions; dribbling and shooting training at different levels. Under normal circumstances, downloading materials from the Internet does not fully meet the teaching needs, and further processing is required.

Teaching video collection. Teaching video collection is mainly recorded and classified according to teaching links (technology, tactics, competition, refereeing, practice). In the process of technical and tactical teaching, due to its strong operability, it can be recorded from multiple angles according to teaching needs. For example, shooting front, back, side and enlarged strong and weak side hand movements, etc.; in the process of screen tactics, recording from the front, side, and back of multiple angles.

The control of the physical education process is achieved through feedback information. The teacher is the control system, and the student is the controlled system. Through the input of information, the teacher compares the output information of the knowledge, skills and other effects that students need to master with the expected teaching plan. Revise the original teaching plan and then carry out teaching through information "input-one-output-input repeatedly" to organically combine the control system and the controlled system. Such repeated teaching adjustments continuously improve the quality of teaching and form a complete physical education process. When formulating a teaching plan, it is necessary to take the syllabus and progress as the premise, fully understand the teaching materials, students, venues and equipment, etc., and reasonably arrange the teaching content, methods and methods of the semester, unit and each class. However, in the implementation of the teaching process, It will still be inconsistent with the actual situation of the controlled object, some unexpected situations will occur, and there will be individual differences between the students, and these situations will be truly feedback in the teaching. Teachers should be good at capturing feedback information, by means of feedback, compassion and control, a comprehensive analysis of it, find out the reasons, timely adjust the teaching plan and progress, improve teaching methods and means, and make it further in line with the actual situation of students.

3.2. Video processing

Network video processing. There are many video formats for downloading from the Internet. Common formats include mov, flv, swf, rmvb, kux, etc., while the video processing software "PishengPiying X4" has limited ability to recognize and process videos in different formats. First of all, you need to use the software "Format Factory" to convert video files into MP4 format that can be recognized and easily processed by the X4. In addition, online videos often contain advertising content or are composed of multiple scenes, and the arrangement of the scenes does not necessarily conform to the logical thinking habits of teachers and students. It is necessary to eliminate advertisements and rearrange the scenes. In Ping Sheng Ping Ying X4, the network video is "segmented by scene" processing, and it is split into multiple single scene videos, and useless or advertising scenes are eliminated according to the needs, while adjusting the sequence of scenes or merging scenes.

Teaching video processing. The instructional video is a single scene video recorded with the help of students, and each scene lasts 10-15 minutes. After the video is imported into Pictograph X4, first use the "Split material according to the position of the jog wheel" function to simply divide the video to remove redundant content. If it is a game session, add an "overlay track" to divide the scene into offensive and defensive segments. The detailed division includes fast break segments, positional offenses, rebounds, and overall defense. Then, use the "Multi-Finishing Video" option to complete the refined processing of the single scene video by "frame" through the "Flywheel Shuttle" function. In technical teaching, the "speed/time lapse" function is often used to slow down movements by 3-5 times, which is convenient for students to learn technical movements; two "overlap tracks" are used to realize the "picture-in-picture" function, and students can compare the same in different periods Action
differences (such as shooting, sliding, etc.); in addition to slow playback of the tactical demonstration, tactical teaching also often uses the "reverse video" function to play the video repeatedly (for example, after a defensive screen fails, play the front and back to find the problem).

3.3. Video library construction

Use the software "All My Movies" tree structure database, combined with the special teaching characteristics of basketball in physical education to build a video library. The video library is generally named "Basketball Special Class Video Library". Video library is divided into individual training and team training are two major systems. Personal training includes shooting, passing, dribbling, defense, rebounding, teaching practice, on-site refereeing, etc.; team training includes rebounding, offensive training, defensive training, basic coordination, tactical exercises, etc. The specific structure is shown in Figure 2.

Figure 2. The structure diagram of the video library of the basketball special class.

The processed video is saved with time as the file name, and then the corresponding attribute information is added to the video through All My Movies. For example, title, classification, player, information description, content; you can also take screenshots of video files and add them to the database as attachments; you can add teacher notes, etc. Through the All My Movies tree structure database, quick search, sorting, extraction and playback according to multiple topics are realized. In addition, All My Movies can also export the relevant information of the team video to HTML, Excel or plain text files, which is more convenient for the management of video materials.

For student assessment, it can be expressed by formula (1). If there is an \( n \times m \) matrix composed of \( n \) students and \( m \) assessment indicators, it can be expressed as:

\[
X = \left( x_{ij} \right)_{n \times m}, \quad i = 1, 2, \ldots, n; \quad j = 1, 2, \ldots, m
\]

4. Multimedia video library fast feedback system application

4.1. Application of skills and tactics in teaching

Physical education major basketball students are affected by factors such as playing age, training level, physical condition, etc., and have certain difficulties in understanding and mastering some techniques and tactics. Before the lecture, the teacher sorts out and analyzes the technical and tactical content involved, and edits the content that is difficult to understand and understands according to the needs of the students through the X4. Through slow playback, reverse playback, freeze-frame screenshots, add animation, dual screens, etc. Difficulties, points, details, etc. of special effects analysis. After the
expected effect is achieved, the video files will be sent to the students to watch through the QQ group before the class; during the class, the coach will give targeted guidance, and at the same time, the multi-view video without affecting the student training is convenient for further after class Analysis: After class, the students' technical and tactical movements are compared and analyzed with the correct movements through the X4, so as to diagnose the students' technical and tactical defects. Send the intuitive images to the students in a timely manner so that they can find their own gaps, understand the key points of technical and tactical actions, use timing, reasonable routes, and coordinate space, and further improve their technical and tactical actions. Through a semester of teaching, the basketball students of our school have made significant progress, and the students have a strong awareness of correcting wrong actions.

4.2. Application in the competition

The game is a very important part of basketball special teaching. Through the game, students' understanding of the court space and the rhythm of the game can be improved, which can help students to understand the lack of objective objectively and promote self-learning and improvement. At the same time, students can also participate in referee practice work during the competition, which helps students master one more skill. However, basketball games under confrontational conditions are frequent, complex and changeable, and difficult to remember, repeat and reproduce. Instead of using a lot of language to retell the problems and give guidance to the competition, the teacher directs the competition, it is better to use the video analysis system to review the key links and important processes of the competition, so as to objectively and accurately evaluate the students and provide targeted suggestions.

4.3. Application in teaching practice

Teaching practice is a very important content of physical education professional courses, and it is a prerequisite for students to start working. The traditional internship process is for the instructor to lead the students. A teacher guides 4-8 interns in writing lesson plans and precautions for class. Then, interns will gradually teach 40-60 elementary and middle school students. However, during the internship process, the intern teacher cannot monitor all the behaviors of the students, and even accidents occur where the teacher does not know the details. The method adopted is to watch the video of the national outstanding teachers' public lectures and the classic problems of the previous interns before the students' internship. The students' lecture videos are recorded throughout the internship process, and the videos are classified and fed back to the students every day. Through the three-month video guidance internship, students have made significant progress and improvement in appearance, presentation and demonstration, and overall organization.

5. Conclusion

This article relies on computer digitization technology and builds a fast feedback system based on a video library; through teaching experiments, the video library construction can obtain the most realistic movement posture, game performance, teaching practice performance, etc. of basketball students, and fast feedback enables students to see themselves in time Technical and tactical movements, competition ability, teaching ability performance and teachers' professional and precise evaluation, the realization of basketball special teaching technology has positive significance and broad prospects.

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