

Construction of a sports experimental teaching system

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ABSTRACT: Experimental teaching based on innovation plays an irreplaceable role in talent development. An experimental teaching system was developed for the teaching of sports informatics, and it is described and discussed here in this article. Multimedia technology was introduced into the experimental course teaching, and is hosted on a network teaching platform. With these new experimental teaching methods and tools, experimental teaching has been improved.

INTRODUCTION

Sports informatics is the combination of sports science and computer science. It uses a training-learning-research model, i.e. research or learning is based on an analysis of training. The sports informatics community includes sports colleges, sports teams and research institutions. Students of sports colleges, apart from their normal studies, undertake sports science research with teams during training. Summarised in this article are the concepts and research areas of sports informatics, together with concrete applications [1].

The author has distilled information about sports informatics and educational technology courses at sports colleges to eliminate duplicate and redundant information and, hence, to systematically derive the teaching content for a putative experimental teaching system for sports informatics. The term, experimental teaching, refers to innovative teaching as opposed to the traditional classroom/lecture method.

SPORTS INFORMATICS EXPERIMENTAL TEACHING SYSTEM

The experimental teaching system for sports informatics based on the training-learning-research model includes the principles for constructing the experimental teaching system, as well as the teaching methods, and the experimental teaching technical platform [2].

Constructing the Experimental Teaching System

Bearing in mind costs, the following principles were identified, after consultation and reflection, to guide the construction of the experimental teaching system.

Systemic Principle

Due to involving many disciplines and covering many majors, the construction of a sports informatics experimental teaching system is a complex systemic project. The construction must be guided by system theory, especially concerning integrity of the experimental system, interrelationships with courses, and dynamic evolution of the experimental system.

In addition to the orderly planning and integration of knowledge in the experimental teaching, it must be combined with other teaching, such as theory, other disciplines and research, while noting the needs of the local economy and societal needs.

Modular Principle

The sports informatics experimental teaching should cover computer hardware and software, database technology, data acquisition technology, information retrieval, data mining technology, artificial intelligence and simulation. The sports informatics experimental teaching system defines modules so that students of different disciplines and different majors can choose related modules [3]. In the process of defining the modules, the principles of high cohesion within a module and low coupling between modules should be respected to allow for differences and relations among disciplines.

Hierarchy Principle

In addition to a lateral division of the subject, according to the different teaching aims, there needs to be vertical hierarchies for these aims so as to produce a graduated experimental teaching system to meet the different learning needs of students in different grades and for different purposes.

Profitability Principle

No matter how the subject is divided horizontally or vertically, the success of the experimental teaching system depends on its benefits. There are three types of benefit: first, technical benefits to meet the training targets; second, economic benefits derived from the software and hardware environment; and third, social benefits to society [4]. If the three benefits are manifest, the success of the sports informatics experimental teaching system will be guaranteed.

To construct an undergraduate experimental teaching system of sports informatics involves two steps. First, it is necessary to understand and analyse sports experiments. Second, an integrated design must be produced guided by the systemic, modular, hierarchy and profitability principles.

The aim of college sports informatics training is to develop practical abilities combined with meeting the needs of society, especially, in the coastal developed areas of China. After analysis of the requirements, the training was organised in a co-ordinated manner, highlighting teaching innovation and quality [5].

The system embodies reform and innovation using information technology to construct the experimental teaching platform. The system reflects the use of scenarios and the multidisciplinary nature of sports information technology. The modules and hierarchies are depicted in Figure 1.

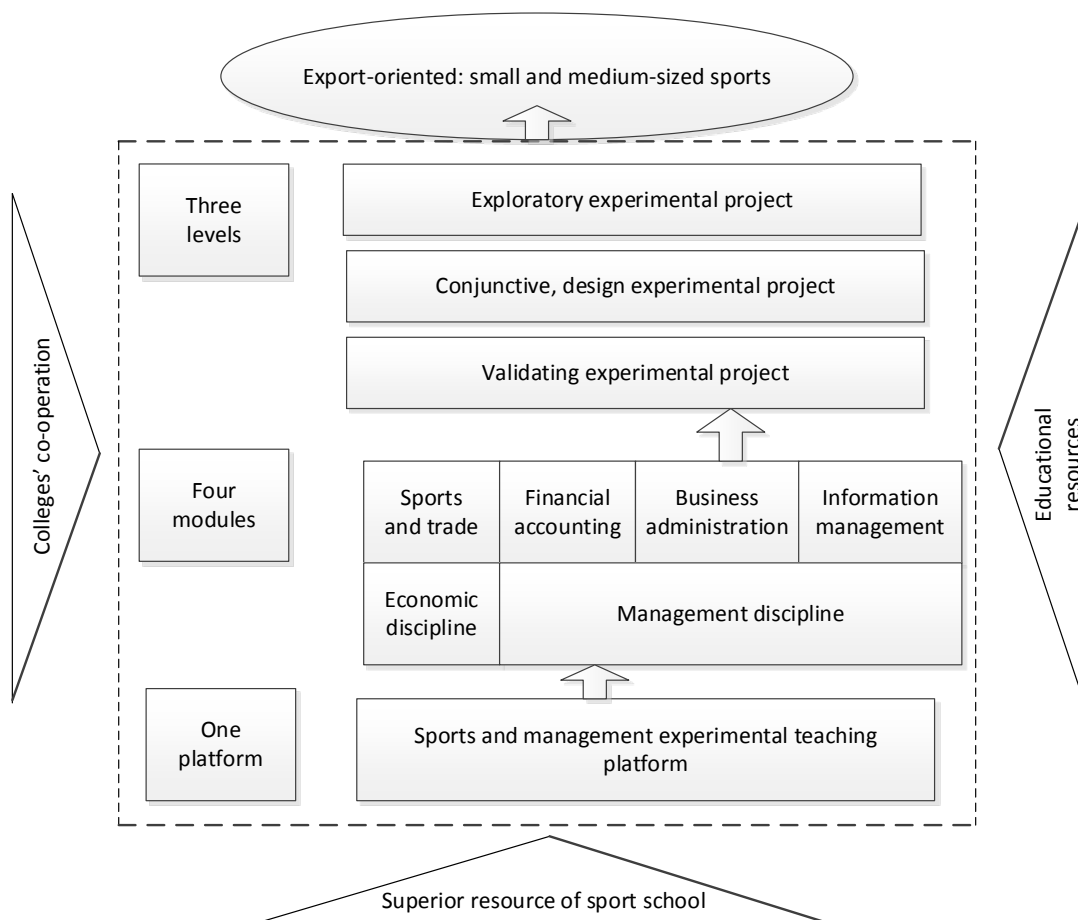


Figure 1: Experimental teaching system.

TEACHING METHODS

Multimedia Technology

The application of information technology has a long history in the sports field and is important in sports informatics. Multimedia teaching methods in education are an important result of the information revolution. Multimedia teaching courseware is a modern teaching tool, and using multimedia teaching methods has become a trend in the development of world education technology. This has promoted the updating of teaching methods and improved the efficiency and quality of teaching.

In the traditional teaching model, teachers give a lesson using a blackboard perhaps augmented by a device such as a projector. Teaching in this way is monotonous, and involves a one-way transfer of knowledge. Only a few students in the front of the class can properly see and hear the teacher [6].

Adopting multimedia teaching overcomes the drawbacks of the traditional teaching model. Learning material can be put on the Internet for students to learn on-line or to download. Multimedia teaching systems integrate text, sound, graphics, images, and animation, as well as other means, which increases students' interest and offers a vivid learning environment.

Multimedia courseware allows learners to choose the teaching content and time according to their own needs, which realises individualised learning. The left and right hemispheres of the learner's brain are used, which can improve the ability to analyse and to solve problems. The application of multimedia teaching in experimental teaching has changed the traditional teaching process and content; it has the strong advantages of visibility, interactivity, flexibility and diversity. Multimedia technology will continue to play an important role in experimental teaching reform.

Network Teaching Platform

The opening times of laboratories could be extended to provide more opportunities for students to carry out experiments. But, staff may not be available to support the extended opening time. This problem can be resolved by making use of a modern teaching management information system and the Web site, to set up an *on-line open laboratory*. Hence, the multimedia courseware and virtual simulations of experiments will be placed on the Internet.

Students can watch at any time after downloading material or watch it on-line. Hence, the scope of the laboratory has been extended, and students can learn autonomously. Students can preview work. Teachers can solve problems and offer guidance on-line for students doing research. Teachers can make informal appointments for students who are trying to gain the support of schools and departments to build special design laboratories.

Systematic Experimental Teaching

The content of experimental teaching includes an overview of sports informatics, sport information resource retrieval, sport multimedia techniques, sport office software, sport data acquisition and processing. After mastering this content, students are able to carry out independent research.

EXPERIMENTAL TEACHING PLATFORM

The experimental teaching platform is based on the research resources of the key laboratories, and integrates multimedia technique analysis, tactics analysis software and a skill and tactics database. The platform provides resources retrieval, data acquisition, data mining and other services for teaching as shown in Figure 2. The experiment teaching platform also allows students to input information into the database, e.g. legacy informatics information.

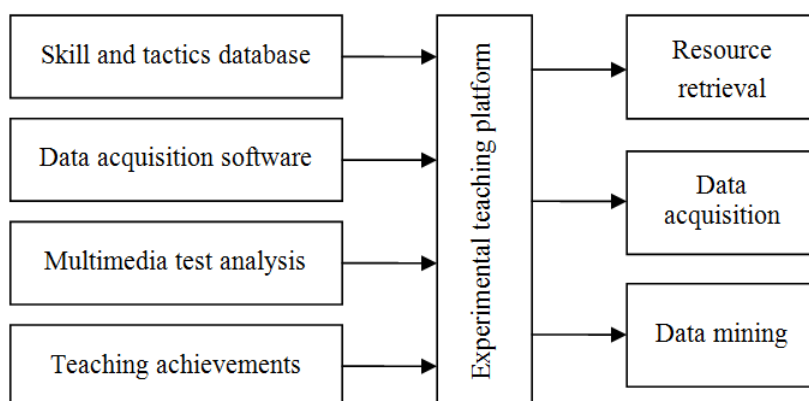


Figure 2: Experimental teaching platform for sports informatics.

CONCLUSIONS

The new experimental teaching system based on multimedia techniques, network technology and other modern information technologies can improve significantly the experimental teaching of sports informatics. It also cultivates quality scientific talent, with a solid foundation and strong innovation ability.

With the continuing development of technology and teachers' increasing use of modern technology, it is important for higher education to cultivate talent with the knowledge and ability required to engage in interdisciplinary science and technology research.

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