Programmed teaching as applied to track and field

Jianguo Qi

Yanbian University
Jilin, People's Republic of China

ABSTRACT: With the rapid advance of science and technology, sports science has also shown similar rapid development. In this context, the author has combined a modern multimedia teaching method and programmed teaching to the track and field, producing good results. This is called the multimedia information programmed teaching method. There has been much research on teaching methods for physical education in universities and colleges. The programmed teaching method has been accepted by students majoring in sports and has been increasingly used in teaching.

INTRODUCTION

New methods are being sought for sports teaching as alternatives to the traditional method. The traditional teaching has thrown up a range of development ideas. Therefore, the primary task is to explore new teaching methods in the development of physical education teaching. *Process teaching* focuses on the processes involved in learning rather than the end result of the learning. It is a contemporary teaching method which, because of its interactive nature, gains acceptance from teachers and students.

PROGRAMMED TEACHING

Programmed teaching is a variation of process teaching involving a detailed programme of study. In programmed teaching, the teaching content is carefully and logically ordered to produce a detailed, programmed set of teaching activities [1]. This approach enables students to better address a difficult curriculum.

Types of Programmed Teaching

There are three types of programmed teaching; namely, linear, branch and mixed. The linear type involves a number of teaching steps attempted in linear sequence. Branch is similar, but usually has larger steps. If a student has difficulty with a step they can branch off into a side sequence of remedial teaching steps. Mixed is a mixture of linear and branch types. The type of programmed teaching used would depend upon teaching content, teaching hours and techniques.

Branch Programmed Teaching

Branch programmed teaching is normally adopted for multimedia information programmed teaching. Branch programmed teaching has broad steps, which is suitable when there are fewer hours for teaching.

A variety of information is used to optimise the process of the students' learning, so as to guarantee the teaching quality of the main programmed and the branch programme. A branch programme divides the learning contents into logical units, with steps that are bigger than those of a linear programme [2].

After students have learned a logical unit, there is an evaluation and test. The next step is determined by the test results. If students understand and grasp the contents of a step, they proceed to the next step. If they do not grasp the contents of a step, they enter a branch programme to enable them to correct their misunderstandings. They, then, again do the step they failed.

Students who mastered the step, do not need to do the branch programme and proceed to the next step in a linear manner [3]. Hence, branch programmed teaching accommodates slower learners alongside the better, without slowing down the better learner or preventing the slower learner from completing the programme.

History of Programmed Teaching

Programmed teaching uses teaching materials broken down into steps to allow learners to learn by themselves. The idea originated in the US to provide a teaching machine by which to present material to learners. The first teaching machine was developed in the 1920s by American S.L. Pressey.

In the 1950s, B.F. Skinner developed a *linear* programmed teaching method. In this method, learning content is divided into many small steps, which each student steps through in turn. Once they meet the requirements of one step, they proceed to the next. Later, American Norman Crowder developed the *branch programmed* teaching method [4].

PROGRAMMED TEACHING METHOD

Following are the components and considerations for designing a programmed teaching method for track and field sports teaching.

The curriculum was divided into pre-class preparation, classroom teaching, teaching evaluation and, then, the next step, which are carried out cyclically.

• Pre-class preparation is divided into determining the goals and tasks, decomposing the teaching content and designing programme steps.

• In classroom teaching, teachers use computers so as to present problems. Students discuss the problem as part of self-study and, then, input their answer. If correct, they are presented with the next problem. If not correct, teachers will communicate with the students to guide them by covering supplementary material. This enables the students to understand the problem, determine the correct answer and continue to the next problem.

• Teaching evaluation can be divided into classroom teaching, a specific period of teaching and the final stage of teaching. Evaluation of classroom teaching is undertaken by teachers, of students' performance in the classroom. The evaluation measures the students' grasp of the material. The evaluation of a specific teaching period is a detailed process by teachers of students' knowledge at a specific stage. The evaluation of the final stage of teaching is more comprehensive and focused on the final examination.

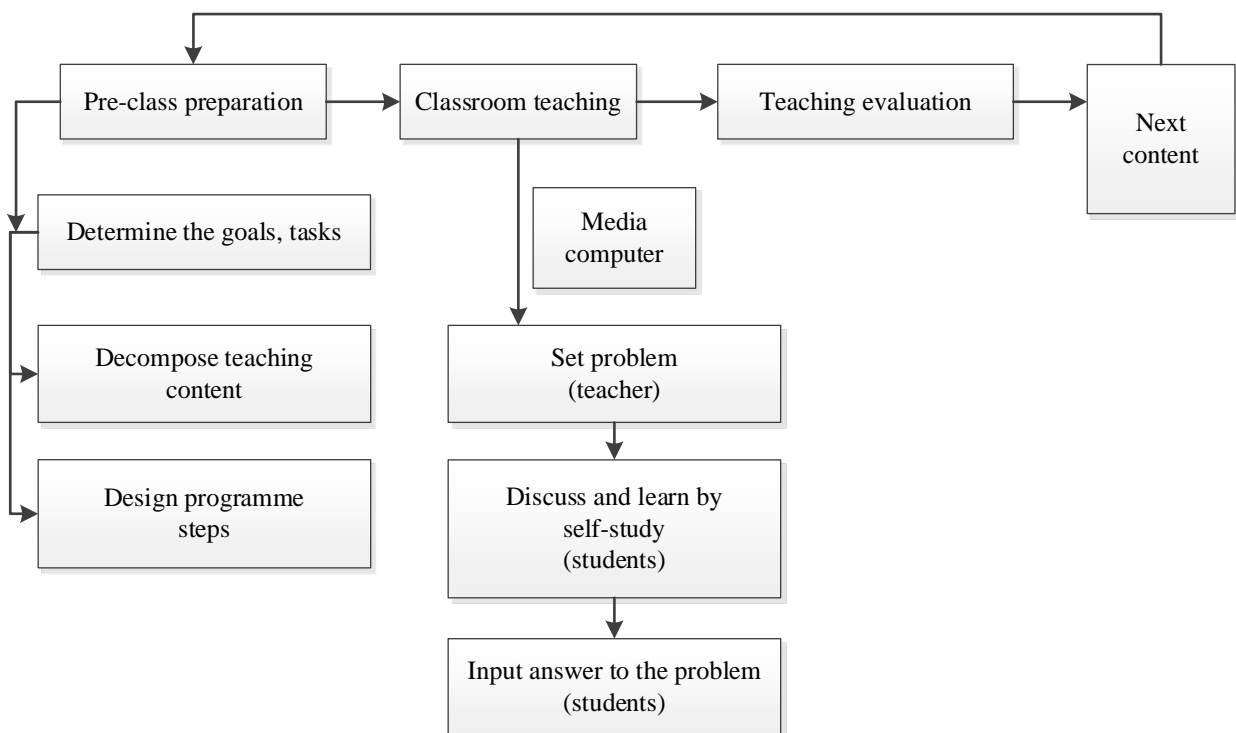The process is shown in Figure 1.

Figure 1: The programmed teaching process.

The Form of Evaluation

Evaluation is carried out after each technology unit. Generally, the form of evaluation can be divided into teachers' evaluation, students' evaluation and evaluation using video. Evaluation methods include language tips, collective evaluation, self-evaluation, and the contrast between audio and video.

Teachers can edit video teaching films to create reference standards. The contents can include complete technique, decomposed or partial technique, and special exercises. Complete and partial techniques may be displayed in normal, fast or slow motion.

The techniques of elite athletes act as an excellent reference standard by which to evaluate students' performance. Such a teacher evaluation will depend on the condition of the students combined with teacher-provided tips on technique. Animated diagrams may be used to help make evaluations.

IMPLEMENTATION OF THE PROGRAMMED TEACHING METHOD FOR PE TEACHING

The programmed teaching method was introduced into physical education (PE) teaching at Yanbian University. Its implementation does, of course, reflect characteristics of physical education, as follows:

- Preparation activities before training are activities that help students to be in good, physical condition for the teaching and to ensure they can practice according to the programme steps.

- Demonstration and explanation is an indispensable part of any teaching. Teachers can explain the required actions to students and also provide a visual demonstration, so as to make students understand the complete action and technique. Students can clarify each step required and develop self-control in the action.

- At the end of the course, teachers should observe, record and evaluate the technique of each student. Then, students evaluate each other, and compare these assessments with the teachers' assessments. This improves students' self-assessment abilities.

RESULTS OF THE PROGRAMMED TEACHING OF PE

Student Questionnaire

The aim of PE teaching is to develop students with good physical qualities in order to meet the needs of society [5]. No matter what kind of teaching methods are adopted, the ultimate aim is to develop the students' physical ability and technical skills to the greatest extent possible.

A questionnaire was used to measure the effect of the programmed teaching of PE. A total of 32 students were surveyed. In the questionnaire, students were asked about their attitudes toward, and level of knowledge after, programmed teaching. The results are shown in Table 1.

Table 1: Student attitudes to programmed teaching (n = 32).

Acceptability					
Attitude	Very	Partial	Neutral	Generally no	No
Use of computer	6	13	9	4	0
Using programmed teaching in track and field teaching	9	10	11	2	0
Applying with this teaching form	5	15	10	2	0

Table 1 shows 28 students or 87.5% accept programmed teaching using computers (*very*, *partial*, *neutral* in the table). Thirty students or 93.8% accept programmed teaching for track and field. Also, 30 students or 93.8% like this form of teaching. There was no-one who could not accept programmed teaching, which is similar to other or earlier findings [6].

By interviewing students who do not accept programmed teaching (*generally no*, *no* in the table), it was found that classroom teachers did not have time to answer students' questions, which caused them to lose confidence in the learning for this course. Therefore, in programmed teaching, teachers should answer all students' questions or address any errors in a timely manner.

Students' Acquisition of Knowledge

Students' grasp of knowledge and their improved abilities can be taken as a measure of the value of programmed teaching. The students' grasp of knowledge is shown in Figure 2. Ninety-seven percent of students feel themselves very clear, clear or somewhat clear about the knowledge; of these 50% were very clear.

This indicated that the teaching programme enabled students to thoroughly grasp knowledge. It also showed that the programmed teaching method can be used widely in teaching.
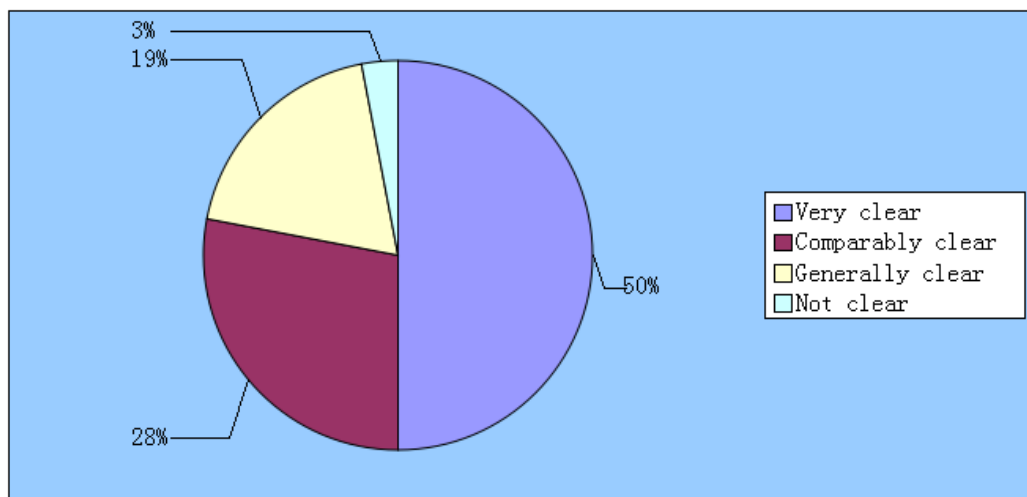

Figure 2: Students' mastery of knowledge.

Students' Abilities

The students indicated they have developed a very strong ability to identify and solve problems, which has been most improved. One hundred percent of surveyed students feel they are *generally effective*. Ninety-seven percent of students felt they had an improved self-learning ability. Eighty-one percent of students felt they were efficient in learning.

These results indicated that programmed teaching can help students to identify and solve problems, as well as helping their self-learning. The reason for these results relate to the main characteristics of programmed teaching, in that students solve problems with the teacher's tips or teacher guidance.

Programmed Teaching and Traditional Teaching

The obvious advantage of programmed teaching over traditional teaching is to develop students' self-study and self-evaluation abilities. The aims of programmed teaching are clear, which benefits individual learning and also accommodates individual differences. But, there are also shortcomings. The learning pace is too strict, which does not assist the development of creative abilities. The relationship between teachers and students and the teacher's leading role is weakened [7].

Programmed teaching is one method among many teaching methods. Its use in PE teaching should be promoted alongside other teaching methods rather than replacing other teaching methods, which may also produce good learning outcomes. Programmed teaching in China is still a relatively new teaching method, which needs to continue to be used. Therefore, further research into this method for the teaching of physical education is required.

CONCLUSIONS

As shown by the work reported here, programmed teaching of track and field in PE, can improve students' learning and develop their abilities. The relationship between teachers and students or students and students is more harmonious; they guide each other in the class, and there is mutual help and co-operation. Students feel that programmed teaching is better than conventional teaching.

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