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Research Article

The Teaching of Sports Physical Education Skills under Exercise Physiology Based on Support Vector Machine

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As the core component of a physical education teacher's professional skills, sports skills are the precondition for physical education teachers to teach and also a key factor for the level of a physical education teacher's professional skills. According to the survey, the current sports skills of graduates majoring in physical education are not satisfactory, and a considerable number of students think that their sports skills are difficult to meet the needs of educational practice. In the era of basic education reform and teacher professional development, we analyze the advantages and make up for the deficiencies in order to improve the effect of physical education professional sports skills training and meet the society's needs for high-skilled sports talents. The experiment randomly selected five physical education students from five schools and five students as the research objects. Based on the support vector machine, the questionnaire survey method, interview method, and statistical method are used to conduct related research and analysis on it. The results show that sports skills are the advanced stage of sports technology development. At present, there are many sports skills that students learn in major colleges and universities, but they really master the sports skills. Motor skills are rare. At present, the future talents of physical education major are mostly "compound" and "specialized" talents, and there are few references to applied talents. The training objectives should be clear, the curriculum should be closely linked to the training objectives, the selection of skills teaching methods by teachers should be adapted to the teaching content, and teachers and students should be actively active among these elements, which are both used and influenced by these elements.

1. Introduction

Pedagogical skills are the basic skills needed to work as a physical education teacher. Graduates of the College of Physical Education are an important driving force for future physical education teachers, but good teaching skills are also required. Teaching skills are therefore essential professional competence for graduates of the College of Physical Education. The main goal of training graduates in physical education is to qualify them as physical education teachers in colleges and universities. Physical education colleges are the cradle of physical education teachers. Improving the teaching level of graduates majoring in physical education in physical education colleges requires the continuation and improvement of the schools themselves. Strengthening the preparation of physical education graduates in pedagogical skills is in line not only with the development needs of students but also with the needs of future jobs and the requirements of physical education reform. Currently, there is a lack of research that focuses on evaluating the teaching skills of graduate teachers with physical education in the classroom. Through his research, the author found that the purpose of classroom teacher skills training for physical education undergraduates is unclear and unfocused, resulting in a lack of understanding of the entire classroom teacher skills training system in the implementation of classroom teacher skills training plans for physical education undergraduates, resulting in unbalanced and incomplete development of students' classroom teaching skills. Moreover, the assessment of students' classroom teaching skills is a one-off assessment after the placement. Due to the relatively unique purpose of assessment, it is not possible to predict and analyze students' ability levels in the classroom and all the functions that assessment should have in due

course. Therefore, the above points provide a sound basis for the development of a system for indexing classroom teacher assessment skills for undergraduate physical education students.

Many national and foreign experts are also studying the maintenance of vector machines and the teaching of sports and physical skills. Escriva-Boulley et al. have used a randomised controlled trial to investigate the impact of a professional development program for teachers based on self-determination theory (TPD) on improving teachers' motivational models to increase students' physical activity during PE lessons [1]. White et al. strongly advocate the removal of rugby from physical education in schools, as rugby is the leading cause of rugby injuries [2]. Bekiari and Pylarinou investigated the relationship between PE teachers' claims and students' perceived social communication styles and students' reasons for learning the subject. The sample included 252 students aged 10–12 years [3]. Bouboulis et al. proposed a new framework of complex support vector regression (SVR) and support vector machines (SVM) for quarterly classification. This method uses the concept of extensive linear estimation to model the relationship between input and output of complex data [4]. Badau's study aimed to assess the level of training related to the application of AE subjects in academic physical education and sports programs [5]. Zhang and Xie's study investigated the application of nontraditional models for modelling travel mode choice, which have traditionally been based on decomposing discrete choice models such as polynomial logit models [6]. However, because the data and methods used in these studies are not appropriate, there are some controversial issues that lead to meaningful results that are not recognized by the general public.

The assessment of physical teaching competence in the classroom is an important symbol of the standardisation and institutionalisation of the management of physical teaching and an important criterion for assessing the impact of the development of teacher education in the classroom. The implementation of teaching level evaluation in physical education classroom is a powerful guarantee for the self-improvement and self-restraint mechanism established in the internal implementation process of physical science education management. The aim of this paper is to guide and evaluate the evaluation of postgraduate education in physical education by creating a system of indicators for assessing physical education competencies and to make a preliminary evaluation of the application of the indicator system in physical education. Since there has been no relevant research on indicators for evaluating physics students' teaching skills in the classroom, an indicator system for evaluating teaching skills in the classroom was investigated for the first time in the study in combination with the actual needs of physics students. It conducted a thorough evaluation of physical education students' classroom teaching and management skills to understand the problems and gaps in the development of classroom teaching skills, analyze the factors that affect them, explore countermeasures, and help students clarify development goals and interventions. It provides an effective reference point for meaningful assessment and monitoring of the development of teaching skills in physical education. It has laid a solid foundation for the sustainable construction and development of physical education. The Physical Education Skills Assessment Framework promotes the comprehensive and timely development of physical education skills. It provides a theoretical framework and concrete measures for testing physical education and is of particular practical importance. Building a system of assessment indicators provides physical education teachers with a framework for developing their classroom teaching skills in the future and is important for improving teachers' basic skills as teachers [7]. The construction of the evaluation index system provides a reference for physical education teachers to cultivate the classroom teaching skills of physical education graduates in the future and has important significance for improving their basic ability to teach as teachers.

2. Methods

Extract the parallelization features and map them into SIMD instructions; this process is called autovectorization and is the main research field of this paper. Automatic vectorization reduces the requirements for programmers, saves a lot of investment in writing repetitive code, and can effectively solve the problem of error-prone manual analysis, thereby shortening the development cycle of the chip and improving the portability of the code.

The DSP vector architecture also has a complete development area, as shown in Figure 1. Development tools include collectors, compilers, and coordinators; repair tools include debuggers and tracers; analysis tools include application development tools and bug diagnostic fixes. All these provide the basic conditions to support the research on this subject. In practical applications, many research institutes and processor manufacturers have identified the differences between traditional vector machines and SIMD command sets, and these differences will affect the results. To increase vectorization, research studies this problem at the hardware and software levels. From the hardware point of view, it learns the characteristics of the multimedia extension instruction set and discovers how to apply SIMD to the hardware level. It looks at the relationship between indexes and data in contrast to traditional analytics. The SIMD vectorized summation method focuses on how to improve the alignment accuracy of command and data alignment methods to improve the performance of SIMD modification [8].

In recent years, LLVM has developed rapidly, and the reason is that it has the following characteristics: reusable, copyright-free, and LLVMIR. In the previous section, reusability makes compiler development easier, and copyright-free makes development less expensive. And LLVMIR plays a key role in the development of LLVM for two reasons: LLVM defines an intermediate description language of its own, which is independent of the front and rear ends so that a large number of optimizations can be carried out here; LLVM first proposed a full-time optimization that attracted wide attention in the industry. Full time is link time, runtime, idle time, compile time, and install time, as shown in Figure 2 [9].

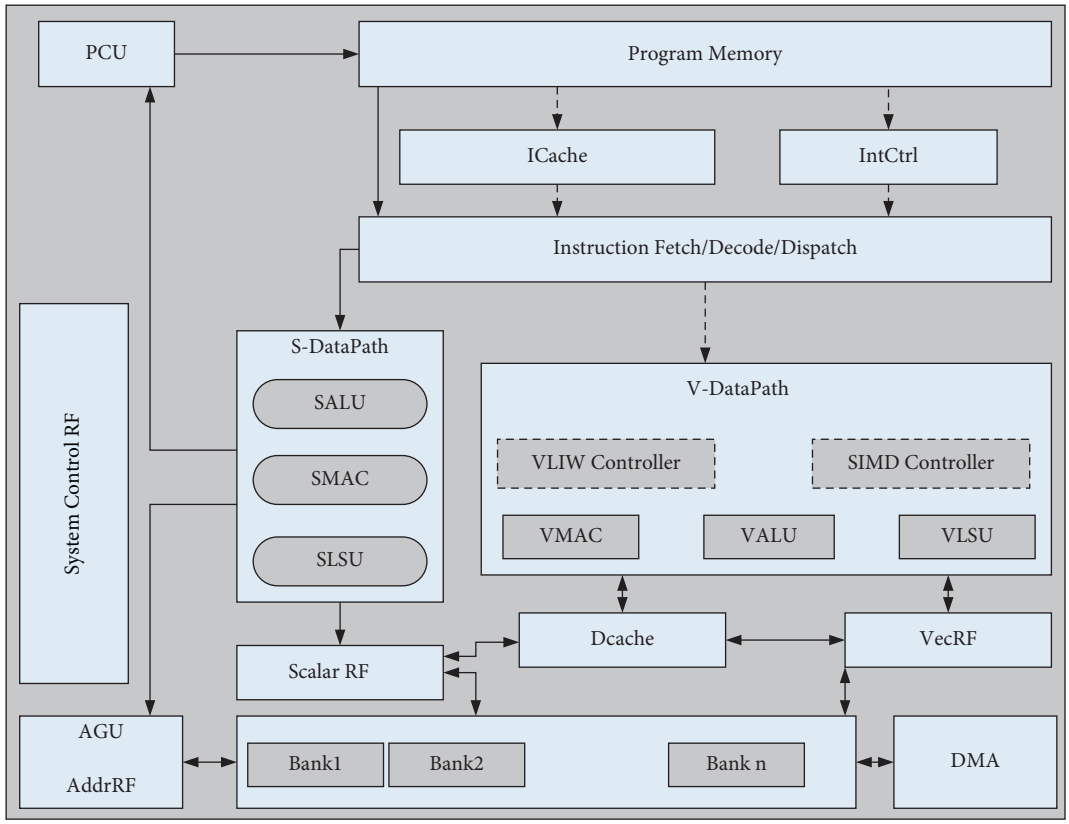


Figure 1: Vector DSP architecture.

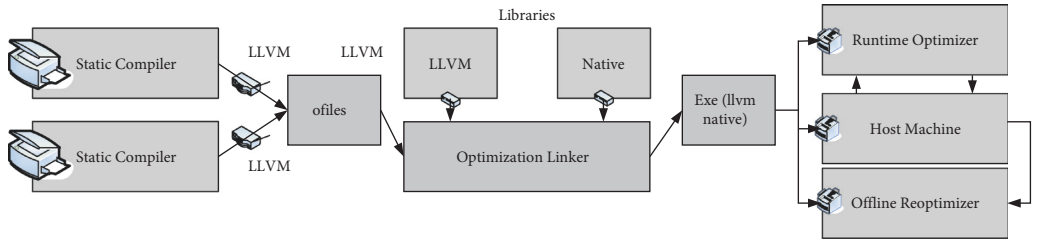


Figure 2: LLVM system architecture.

2.1. Nonsingular Twin Support Vector Machine. However, Table 1 does not allow us to clearly assess the effectiveness of NSTWSVM and TWSVM-b. Table 2 shows the experimental results of NSTWSVM, TBSVM, TWSVM-a, TWSVM-b, and SVM under nonlinear conditions, where these five algorithms all use the RBF kernel function. A comparison shows that the classification accuracy of the nonlinear NSTWSVM is significantly higher than that of TBSVM, TWSVM-a, TWSVM-b, and SVM for most datasets. Moreover, NSTWSVM and TWSVM-b require less computation time than other algorithms. SVM has higher classification accuracy on three of the datasets, but its computational efficiency is significantly lower than that of the other algorithms [10, 11].

In order to demonstrate the ability of NSTWSVM to solve large-scale problems, the NSTWSVM based on SOR technology is tested on the NDC dataset. The scale of the test set is 1000–30000 samples, and each sample includes 10-dimensional features. As can be seen from Figure 3, NSTWSVM has almost the same test time as TWSVM-b and is significantly less than TBSVM. This is consistent with the theoretical analysis; that is, the selection of parameters will affect the calculation speed of TBSVM. Figure 3 shows TWSVM [12] using the QP method on the same dataset. For example, the change of value is realized by 2, 4, 6, and so on each time. Inductive variable optimization is very important in loop optimization, and the way it is chosen can determine the size and performance of the code.

The linker links .obj files together to generate executable files, so the linking process can see the whole program for the first time. The optimization shown in Figure 4 can be performed on the program at this stage. Link-time optimizations at this point manipulate the LLVM bytecode directly and optimize the program with advanced information encoded into it. For example, the link-time optimization APA algorithm directly uses the type information

Table 1: Test rates for linear NSTWSVM.

Dataset	NSTWSVM accuracy Time (s)	TBSVM accuracy Time (s)	TWSVM-a accuracy Time (s)	TWSVM-b accuracy Time (s)	SNM accuracy Time (s)
Australian (690 × 14)	89.47 0.185	88.42 0.919	87.56 2.192	86.52 0.176	87.62 8.36
German (1000 × 24)	75.62 0.156	76.2 1.623	474.5 4.852	71.52 71.32	72.65 15.6
Sonar (208 × 60)	77.21 0.158	73.8 0.158	76.6 0.526	0.123 73.25	79.23 1.25
Bupa (345 × 6)	79.56 0.065	78.64 0.235	76.25 0.606	0.036 78.65	73.75 3.25
WDBC (569 × 31)	97.63 0.025	96.63 0.428	96.56 1.635	0.015 96.54	72.35 4.574
Breast cancer (699 × 11)	87.65 0.125 3.526	87.23 0.159 1.152	85.62 2.035 2.34	0.344 83.65 0.158	84.25 7.654 84.62
Heart (270 × 13)	87.65 0.035	87.652 0.125	83.15 1.65	86.65 0.065	5.35 78.32
Diabetes (768 × 8)	78.65 0.152	76.51 0.845	75.65 9.6	77.62 0.175	78.52 29.36
Ionosphere (351 × 34)	91.62 0.051	92 0.255	88.65 1.651	89.65 0.035	87.65 5.962

Table 2: Test rates for nonlinear NSTWSVM.

Dataset	NSTWSVM accuracy Time (s)	TBSVM accuracy Time (s)	TWSVM-a accuracy Time (s)	TWSVM-b accuracy Time (s)	SNM accuracy Time (s)
Australian (690 × 14)	86.52 0.266	86.06 1.265	85.62 7.6	85.62 0.3512	86.75 18.65
German (1000 × 24)	78.26 0.015	77.6 0.15	77.52 1.652	78.35 0.016	80.64 4.158
Sonar (208 × 60)	65.35 0.026	64.2 0.226	64.62 2.512	63.54 0.035	65.56 6.54
Bupa (345 × 6)	86.54 0.041	85.6 0.185	85.61 2.654	63.52 0.345	83.6 7.523
WDBC (569 × 31)	66.21 0.2568	67.69 1.452	64.65 8.625	92.8 0.064	64.65 29.654
Breast cancer (699 × 11)	94.5 0.051	93.58 1.723	92.35 3.256	71.6 0.045	90.6 11.542
Heart (270 × 13)	73.5 0.13	73.6 2.35	72 13.547	71.5 0.212	70.5 38.651
Diabetes (768 × 8)	77.652 0.265	76.65 1.132	75.68 2.154	76.54 0.251	74.68 7.954

provided by LLVM and allocates the linked structure allocated on the heap in a continuous memory pool to optimize the program. The compile-time and link-time optimizers use a number of techniques to speed up interprocedural analysis. For example, the summary information of each function is summarized and attached to LLVMIR at compile time, and then the function summary information is used directly to complete the analysis of the program during linking without reobtaining the information from the source code, which can reduce compilation time without unduly affecting accuracy [13].

The goal of LLVM design is to develop a new runtime optimization strategy, which collects the running information of the program at runtime and uses it to guide subsequent code generation and optimization. Idle-time optimizations often work in conjunction with runtime optimizations. Idle optimization reads the running information obtained at runtime to guide the code generator to generate more efficient code. Traditional runtime optimization methods have two shortcomings: the information obtained at runtime comes from developers rather than users, but developers actually rarely use the information to guide feedback. Therefore, in practice, the speedup obtained with runtime optimizations is not very noticeable. The reason why LLVM's runtime optimization is different from traditional methods is that the information it uses to guide

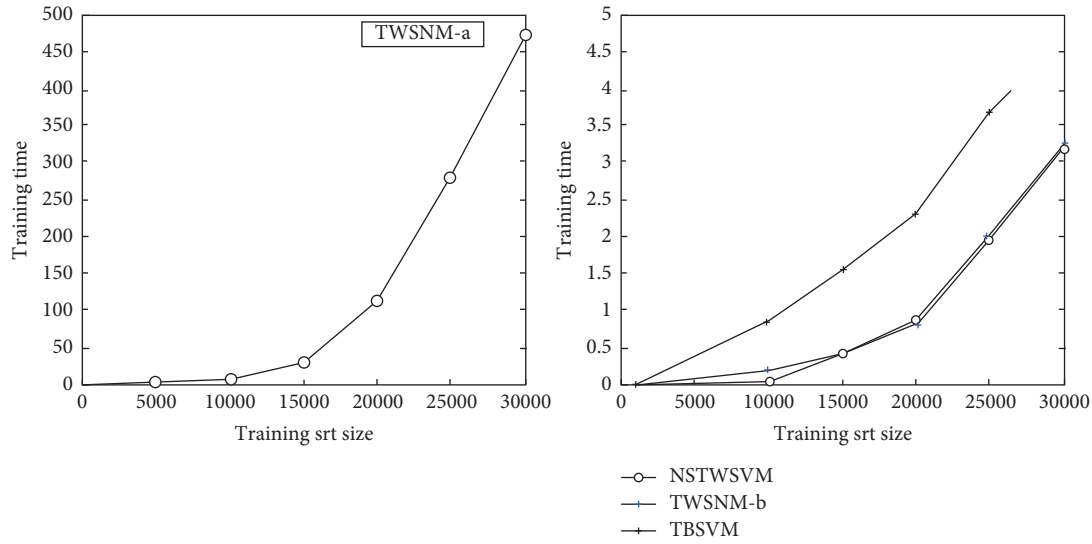


Figure 3: Training time of the model in the linear case.

code generation is the user's runtime information rather than the developer's test information [14].

2.2. LLVM Virtual Instruction Set. LLVMIR is the core of LLVM architecture and the basis of analysis and optimization, and it is a low-level language with high-level type information. It can not only save high-level type information but also is low-level to language-independent, so it can complete a lot of analysis and optimization, which is the biggest difference between LLVM and other systems. The LLVM virtual instruction set is similar to the three-address format RSIC, which is register-dependent and avoids specific machine constraints such as the number of physical registers and pipelining. At the same time, to facilitate program optimization, LLVMIR provides a set of infinite virtual registers in the form of SSA. In addition, it is a strongly typed language, using an explicit exception control flow mechanism to limit specific instructions to operate memory. If you operate on virtual registers and memory, you must use load, store, and alloca instructions. Figure 5 is an abstract summary of the LLVM virtual instruction set, in which the syntax and semantics are described in more detail in the LLVM reference manual [15].

Usually, whether a loop invariant is controlled by a conditional expression can be verified by using the method of determining whether the expression is a must-pass node in the loop. Figure 6 shows the control flow diagram of the program optimized using LoopRotate. Then, in order to judge whether the invariant will be executed in the loop, it is necessary to find the basic block BB3 where the invariant expression $2/(m-n)$ is located. Then, it is found that, in the process from BB2 to BB4, there is not only BB3, a basic block connected to BB2 and BB4, but also an edge that leads directly from BB2 to BB4. So BB3 is not a mandatory node in the loop, so it is controlled by the conditional expression. It is not necessarily executed in the loop, so the invariant cannot be mentioned. And the basic block where the 7th line instruction $a = a + n * n$ is located is the necessary node in the loop, so this statement can be mentioned. It reduces the program runtime by reducing the number of times. Redundancy is having more than one repeated computation on a certain path in the flow graph. Therefore, if expressions are redundant at program points, they can be deleted while maintaining program correctness. The subexpression $x * y$ in $d = x * y$ is assigned in all paths to BB4 (BB2 and BB3), so it can be redundantly optimized. The optimized method is to reassign the expression in BB3 and BB2 and store the value of the expression in the temporary variable t to replace all the use of $(x * y)$ [16].

In addition to redundant removal, there are also partial redundant removal (PRE) methods, which combine methods such as partially redundant expression recognition and insertion of additional computations along different program paths. First, make the expression fully redundant, and then delete the redundant expression. There are several optimization methods for partial redundancy removal, the most common of which is to use lazy code movement, and it is partially redundant in BB3. The reason why it is partially redundant is that it is only assigned in BB1 and not in BB2 in order to make the statement fully redundant. Using the method of inserting this statement in BB2, the expression becomes completely redundant, and then the program is optimized by deleting the completely redundant expression. Among the optimization methods introduced above, both LICM and redundant expression removal optimization are related to redundant computation, and both require implicit or explicit analysis of data flow. In addition to the two methods described above, redundant computing also includes optimization methods such as common subexpression deletion and code promotion.

2.3. Twin Support Vector Machines. In general, compared to SVMs, TWSVMs are usually used to solve large binary classification problems. Standard TWSVM models are faster than SVMs in terms of learning speed since they can be reduced to solve a few small convex quadratic programming problems. Due to its high work efficiency, TWSVM is more suitable for solving large classification problems. However, in the process of solving quadratic programming problems using TWSVM, there is a

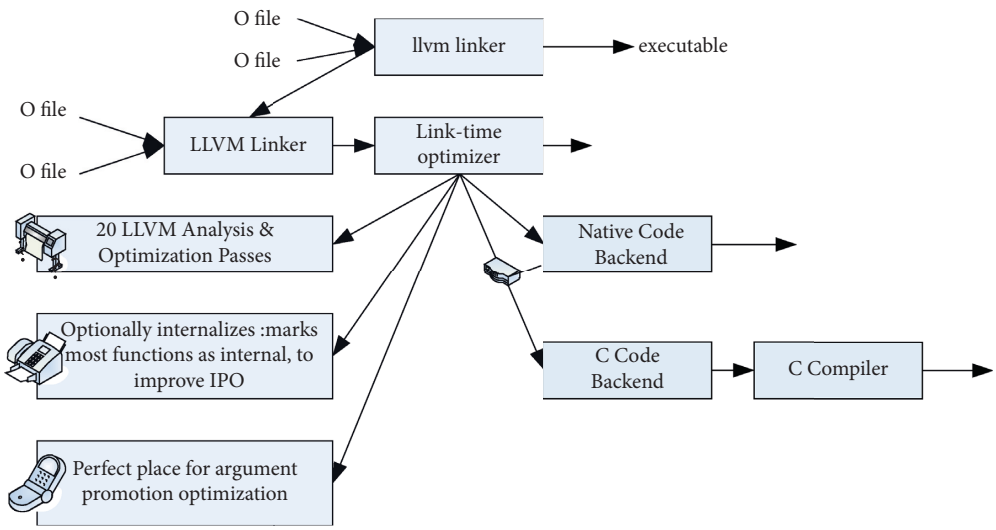


Figure 4: LLVM link-time optimization.

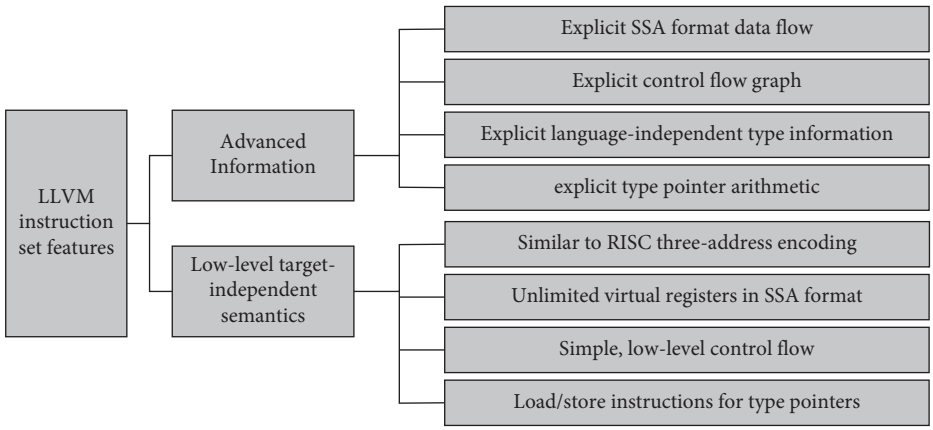


Figure 5: LLVM instruction set features.

"singularity" problem; that is, the matrix of the dual problem of the original TWSVM model is positive (semipositive) definite.

$$\begin{aligned}
&\min_{w1,b1,\xi,\xi*} \frac{1}{2}c3\left(\|w_1\|^2 + b_1^2\right) + \frac{1}{2}\xi^{*T}\xi^* + c_1 e_2^T \xi,\\
&s.t. Aw_1 + e_1 b_1 = \xi,\\
&-\left(BW_1 + e_2 b_1\right) + \xi \geq e_2, \xi \geq 0,\\
&\min_{w1,b1,\eta,\eta*} \frac{1}{2}c4\left(\|w_2\|^2 + b_2^2\right) + \frac{1}{2}\eta^{*T}\eta^* + c_1 e_2^T \eta,\\
&s.t. Bw_1 + e_1 b_1 = \eta^*,\\
&-\left(AW_2 + e_1 b_2\right) + \eta \geq e_1, \eta \geq 0.
\end{aligned} \tag{1}$$

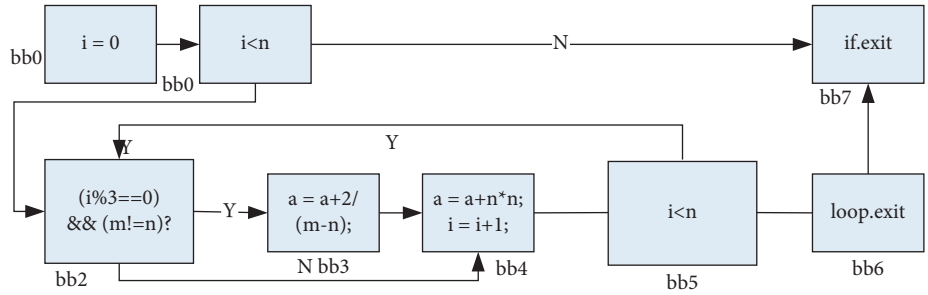


Figure 6: Use case diagram for senior managers.

Now, we can reasonably describe the distance with

$$1\sqrt{\|W_1\|^2 + B_1^2},$$

$$\begin{aligned} L(w_1, b_1, \alpha, \beta) &= \frac{1}{2}c_3\left(\|w_1\|^2 + b_1^2\right) \\ &+ \frac{1}{2}\|Aw_1 + e_1 b_1\|^2 + c_1 e_2^T \xi, \\ &\alpha^T (Bw_1 + e_2 b_1 - \xi + e_2) - \beta^T \xi. \end{aligned} \tag{2}$$

According to the above method, the following dual problems can be obtained:

$$\begin{aligned} c_3 w_1 + A^T (Aw_1 + e_1 b_1) + B^T \alpha = 0, \\ c_3 b_1 + e_1^T (Aw_1 + e_1 b_1) + e_2^T \alpha = 0, \\ c1 e_2^T - \beta^T - \alpha^T = 0 \\ -(Bw_1 + e_2 b_1) + \xi e_2, \xi \geq 0 \\ \alpha^T (Bw_1 + e_2 b_1 - \xi + e_2) = 0, \\ \beta^T \xi = 0. \end{aligned} \tag{3}$$

The quadratic programming problem is as follows:

$$\begin{aligned} 0 \leq \alpha \leq c1, \\ \left(\left[A^T, E_1^T\right][A, e_1] + c_3 I\right)[w_1, b_1]^T + \left[B^T, e_2^T\right]\alpha = 0, \\ \left(H^T H + c_3 I\right)V_1 + G^T \alpha = 0, \\ v_1 = -\left(H^T H + c_3 I\right)^{-1} G^T \alpha. \end{aligned} \tag{4}$$

By weighted average, the overrelaxed iterative formula for solving the system of equations is obtained:

$$\begin{aligned} a_{ii} x_i^{(k+1)} &= (1-w) a_{ii} a_{ii} x_i^{(k)} \\ &. \quad + w\left(b_i - \sum_{j=1}^{i-1} a_{ij} x_j^{(k+1)} - \sum_{j=i+1}^{n} a_{ij} x_j^{(k)}\right), \\ Dx^{(k+1)} &= (1-w) Dx^{(k)} + w\left(b + Lx^{(k+1)} + U_x^{(k)}\right), \\ (D - wL)x^{(k+1)} &= ((1-w)D + wUx)x^{(k)} + wb \\ x^{(k+1)} &= (D - wL)^{-1}((1-w)D + wU)x^{(k)} \\ &. \quad + w(D - wL)^{-1} b. \end{aligned} \tag{5}$$

3. Experimental Analysis and Results

The paper selects 400 students from 5 colleges and 25 physical education teachers in physical education colleges as research objects. It retrieves relevant Chinese and foreign literature, such as "Curriculum and Teaching Theory," "Physical Education Teaching Skills," "Physical Education Teaching Theory," reading, thinking, and summarizing skills, and physical theory. And in accordance with the established requirements, these materials are studied and analyzed in detail to provide a specific theoretical basis for the subsequent discussion, analysis, and solution of current problems.

Question design: in order to ensure the accuracy and validity of the content layout, the research questionnaire was designed on the basis of reviewing the literature and listening to the opinions of tutors and experts. After the approval, a formal questionnaire is formed, and the validity of the questionnaire is tested: according to the content of the questionnaire, four evaluation levels of "very reasonable, reasonable, general, and unreasonable" are designed, and an expert evaluation test is carried out. The basic situation is shown in Table 3.

As can be seen from Table 3, the number of experts evaluated at each level is 12, of which "very reasonable" and "reasonable" account for 92% of the total, and the result

Table 3: Statistics on the validity evaluation results of the questionnaire for 12 experts.

Index	Very reasonable	Reasonable	Generally	Unreasonable
Frequency	3	8	1	0
Percentage (%)	25	67	8	0
P value	0.026	0.063	0.041	0.052

Table 4: Students questionnaire statistics of the questionnaire distribution and recovery of 30% again.

School name	Questionnaires issued	Number of returned questionnaires	Number of valid questionnaires	Effective recovery rate (%)
A	24	24	24	100
B	24	24	22	91.7
C	24	24	19	79.2
D	24	24	20	83.3
E	24	24	23	95.5

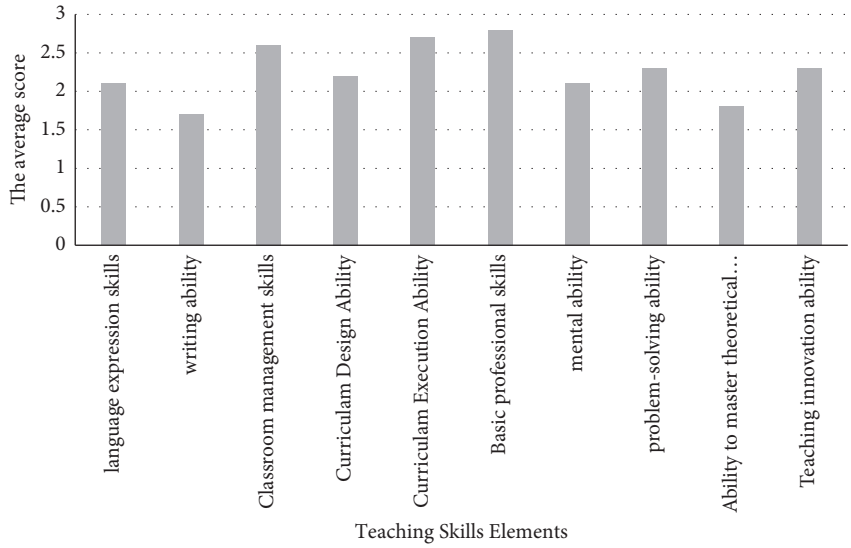


Figure 7: 25 teachers and 376 students' cognitive evaluation results of the components of teaching skills.

shows that the content of the question is valid. Question reliability test: select 30% for retest. At the same time, in order to ensure the reliability and validity of the question, the researchers conducted a survey. It requires the question to be distributed in person, with the necessary explanation for the purpose, as shown in Table 4.

Figure 7 shows the evaluation results for 25 teachers and 376 students. Teachers and students' evaluation of the importance of each teaching skill element is weighted according to the "3-point system"; that is, 3 points are the most important. The average score is obtained by dividing the number of people who evaluated the importance of each teaching skill element in the questionnaire survey by their respective total number, and the importance of the teaching skill element is weighed according to the average score. It can be seen from the table that the overall cognitive situation of teachers and students is consistent. They believe that classroom management ability, curriculum execution ability, and basic professional skills ability are the most important. According to the research results in Figure 7, random interviews were conducted between students and teachers, and it was found that the reason why their cognitive situation was consistent was that students were influenced by teachers' teaching concepts, methods, and training content to a large extent. What teachers think is important will often teach students more information about this aspect in the classroom, and over time, students will form the same views as teachers. In the current teaching state, students' teaching skills and abilities are dominated by physical education. A questionnaire survey was conducted on 25 teachers and 376 students in these five schools. Through the statistics of the questionnaire survey results, the self-evaluation of each school's students' current situation of teaching skills and ability, the overall situation of each school, and the teachers' evaluation of the current situation of their students' teaching skills and ability are obtained. For details, see Tables 5 and 6.

Table 5: The self-evaluation results of 376 physical education students on each teaching skill ability.

Elements of teaching skills and their evaluation levels		The name of the school and students' self-evaluation of their own teaching skills. The number of people in the class and the overall situation				
		A University	B University	C University	D University	E University
Language expression skills	Good (3 points)	11	6	7	16	9
	General (2 points)	47	34	31	42	33
	Bad (1 point)	21	35	32	14	38
Writing ability	Good (3 points)	22	17	15	24	18
	General (2 points)	43	34	31	39	32
	Bad (1 point)	14	24	24	9	30
Classroom management skills	Good (3 points)	17	7	8	15	10
	General (2 points)	35	31	29	34	32
	Bad (1 point)	27	37	33	23	38
Curriculum design ability	Good (3 points)	19	10	12	22	114
	General (2 points)	38	31	27	37	31
	Bad (1 point)	22	34	31	13	35
Curriculum execution ability	Good (3 points)	18	11	10	20	13
	General (2 points)	35	33	29	35	32
	Bad (1 point)	26	33	31	17	35
Basic professional skills	Good (3 points)	26	31	16	28	21
	General (2 points)	38	18	26	34	27
	Bad (1 point)	15	29	28	10	32
Mental ability	Good (3 points)	29	28	23	24	26
	General (2 points)	35	27	31	34	36
	Bad (1 point)	15	33	16	14	18
Problem-solving ability	Good (3 points)	17	15	14	21	16
	General (2 points)	36	12	27	35	30
	Bad (1 point)	26	31	29	16	31
Ability to master theoretical knowledge	Good (3 points)	15	32	9	16	11
	General (2 points) 28	36	7	26	33	30
	Bad (1 point)	30	42	35	23	37
Teaching innovation ability	Good (3 points)	11	6	6	15	9
	General (2 points)	32	26	26	29	27
	Bad (1 point)	36	45	38	28	44
The overall comprehensive evaluation of students' teaching skills and abilities in each school	Good					
	General	√			√	
	Bad		√	√		√

The table shows that the overall situation in the five schools is very bad, except for schools A and D, which are at an average level. This phenomenon has been considered separately by the author, and the main reasons are as follows. From the students' point of view, these two schools belong to private universities. The overall quality standards of the students are slightly higher than those of the other schools. Given the management and confidence of the students, it is not surprising that they are better than some of the other schools. In terms of teachers' education of pupils' educational skills: different schools have different teachers' pedagogical skills and hardware conditions, and teachers' level of education is also an important factor influencing the education of pupils' educational skills. Teacher training methods and teaching concepts in the two schools have been somewhat updated based on the traditional teaching method. The emphasis is on students learning independently and shifting the teacher's role to that of students as primary learners. The excellent hardware environment provides students with more opportunities to acquire teaching skills. In terms of school management, the school management systems and policies have a big impact on the development of students' teaching skills. In comparison, these two schools have a more rigorous management system than the other three schools, and the implementation of formulated pedagogical measures is higher than that in the other schools. Table 6 shows the statistics of the overall assessment of the current situation of the five PE teachers in each school regarding the development of pedagogical skills and abilities of the student athletes in each school. The table shows that all

Table 6: The overall evaluation results of 25 physical education teachers on students' teaching skills and abilities in each school.

Teaching skills elements	Evaluation level	The name of each school and the number of teachers who evaluated the overall situation of their students' teaching skills and abilities				
		A University	B University	C University	D University	E University
Language and writing skills	Good (3 points)	2	0	0	2	0
	General (2 points)	2	2	2	3	4
	Bad (1 point)	1	3	3	0	1
Classroom management skills	Good (3 points)	0	0	0	1	0
	General (2 points)	4	2	3	4	2
	Bad (1 point)	1	3	2	0	3
Curriculum design and execution ability	Good (3 points)	2	0	0	3	0
	General (2 points)	3	2	2	2	3
	Bad (1 point)	0	3	3	0	2
Basic professional skills	Good (3 points)	2	0	0	2	0
	General (2 points)	2	3	3	3	2
	Bad (1 point)	1	2	2	0	3
Psychological quality and problem-solving ability	Good (3 points)	1	1	1	2	1
	General (2 points)	3	2	3	2	3
	Bad (1 point)	1	2	1	1	1
Theoretical knowledge mastery and teaching innovation ability	Good (3 points)	1	0	0	1	0
	General (2 points)	3	1	2	3	2
	Bad (1 point)	2	4	3	1	3

schools have PE teachers who assess the pedagogical skills and abilities of pupils for each of the elements of pedagogical skills. The percentage of each element can be used to assess the overall level of students in a given school. Intuitively, the table shows that the schools with slightly better overall ratings are University A and University D.

Teaching skills are an essential characteristic of all teachers, and the quality of teaching skills is directly related to the employability of PE students. Many students think that it is enough to know at least a little about all aspects of the profession. They do not know that teaching skills cover many aspects, and they do not know how important teaching skills are for themselves. A questionnaire survey was conducted to find out to what extent the students themselves are aware of the importance of cultivating the elements of teaching skills. The concrete results are presented in Figure 8.

Figure 9 is a statistical table of questionnaires on the cognition of physical education students in five universities (i.e., 79 students from A University, 75 students from B University, 70 students from C University, 72 students from D University, and 80 students from E University) about their own teaching skills training. It can be seen that the students majoring in physical education in each school have cognition on the cultivation of various teaching skill elements. Judging from the proportion of the number of people shown, the proportion of people who think "important" is the largest, followed by "general," again "very important," and finally "unimportant." In this way, most students have a clear understanding of their own teaching skills training, but some students have not paid attention to it. The level of students' teaching skills will directly affect their employment, so teachers should strengthen the training and training of students' teaching skills in all aspects in the usual teaching process so as to arouse their awareness and attention to the training of teaching skills.

As shown in Figure 10, it can be seen that the proportion of students in each school is very dissatisfied with the curriculum. Academic courses include big and small ball, martial arts, aerobics, gymnastics, and track and field; theoretical courses include school sports, sports psychology, sports training, introduction to sports, sports human body and anatomy, sports statistics, and sports measurement and evaluation. Students study a lot of courses every day. Some courses are not interesting to students but they are offered more, but there are very few class hours that are really ranked in professional courses. The professional courses arranged by the five schools are basically two classes per week. Due to the limited space and equipment in the schools, students usually do not learn anything at all after a class and cannot meet the needs of students. Therefore, in the implementation of the curriculum, schools should follow the actual situation of the school, try to meet the needs of students, reasonably arrange the structure of class hours, and improve the teaching system. The evaluation grading standard is based on the responses to the student questionnaires surveyed by each school. A total of 80 questionnaires were distributed to students in each school. The questionnaire responses were more than 40 points as good, 30–40 points as average, and less than 30 points as poor. Through the statistics of the questionnaire and the author's field investigation, the results of the table are in line with reality. The quality of the school's hardware facilities is also an important factor affecting the formation of students' teaching skills. Due to the lack of venue equipment, students may not be able to take classes normally, reduce their enthusiasm and attitude in class, and make students tired of taking certain classes. Students' learning attitude plays a direct role in the formation of their teaching skills. D University is a national "211" and "985" key university, A University is a national first-class key university, and the

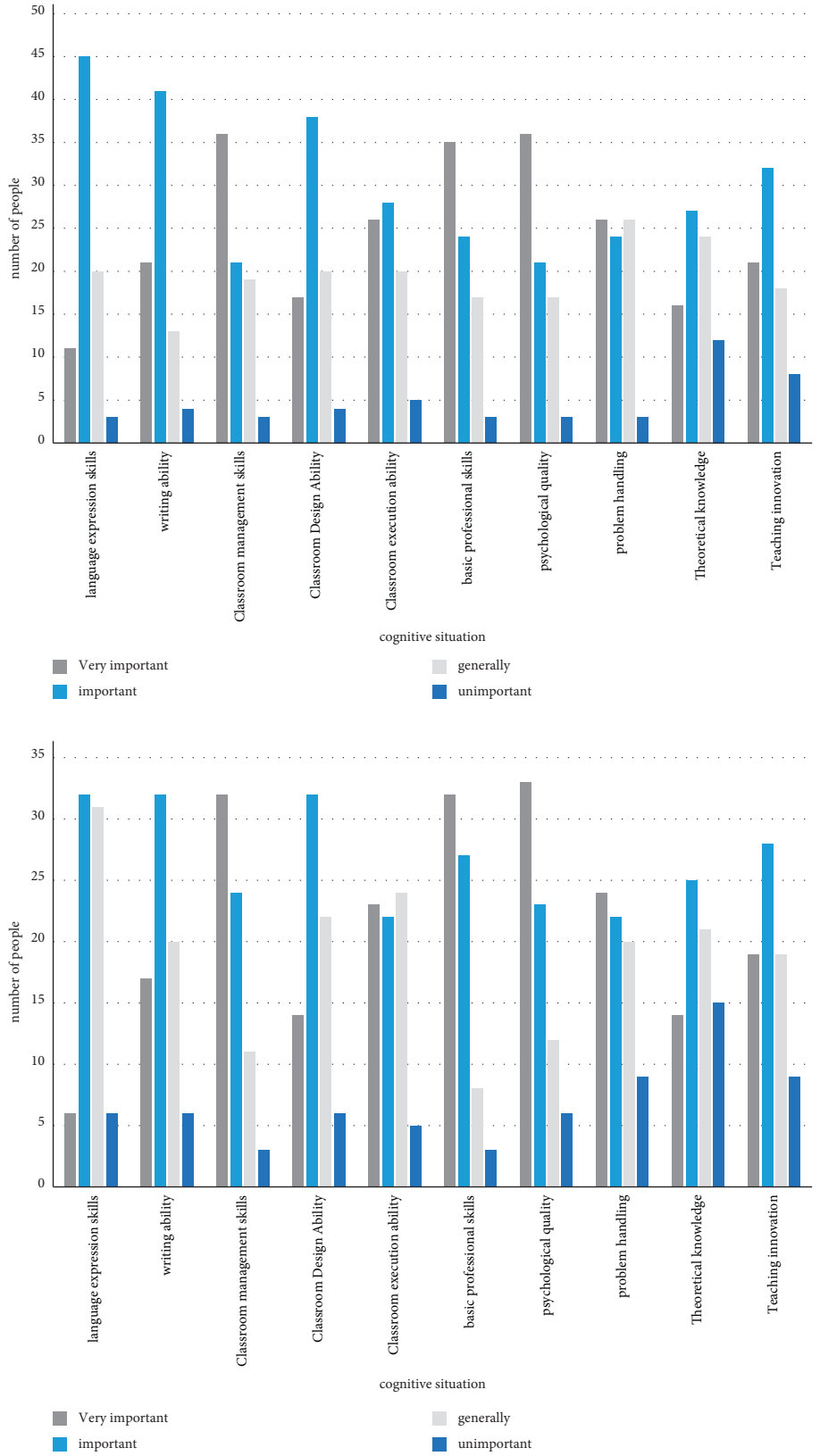


Figure 8: 376 students' perceptions of the importance of the cultivation of various teaching skill elements. The results of the questionnaire A and B University survey.

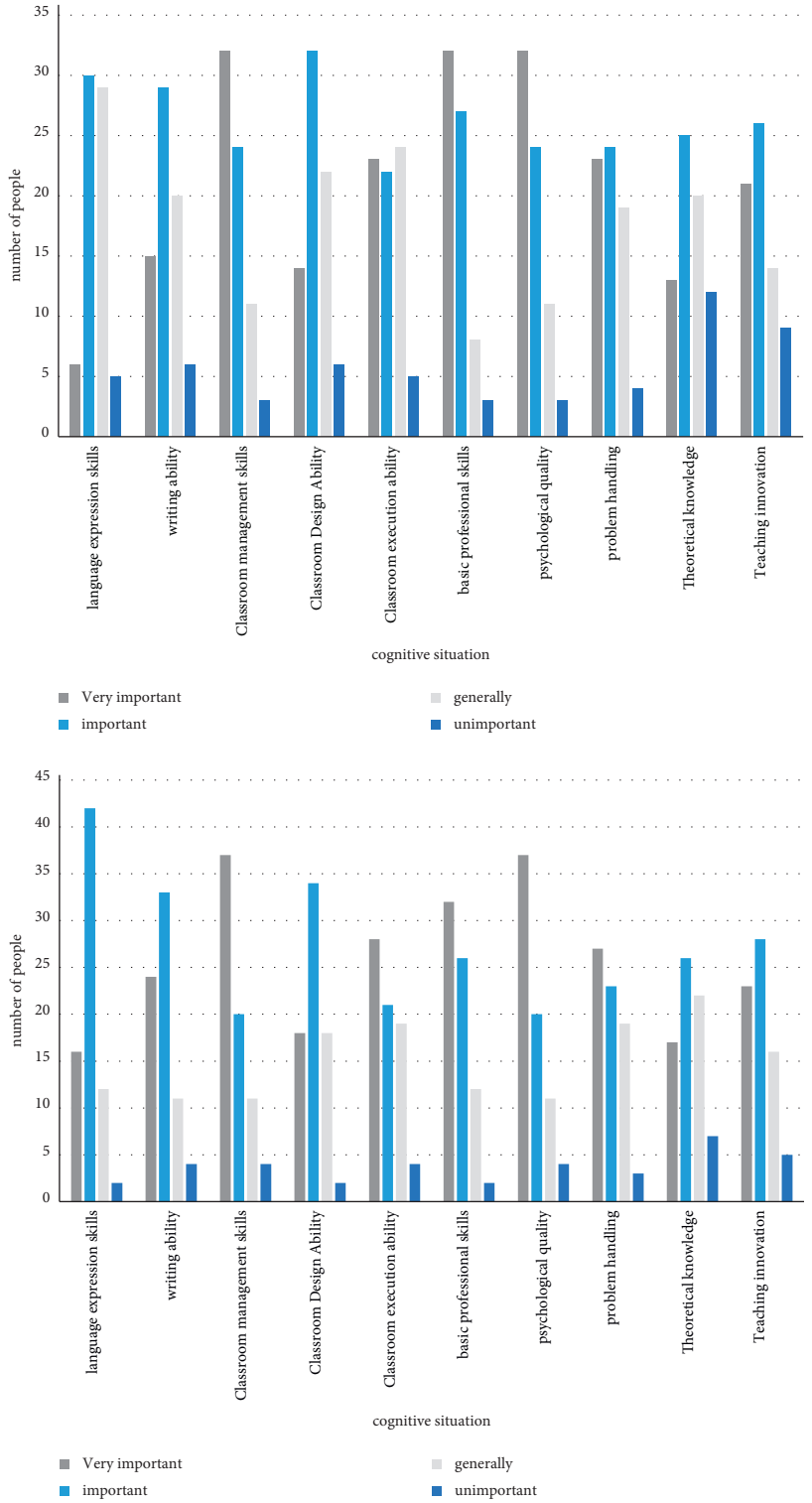
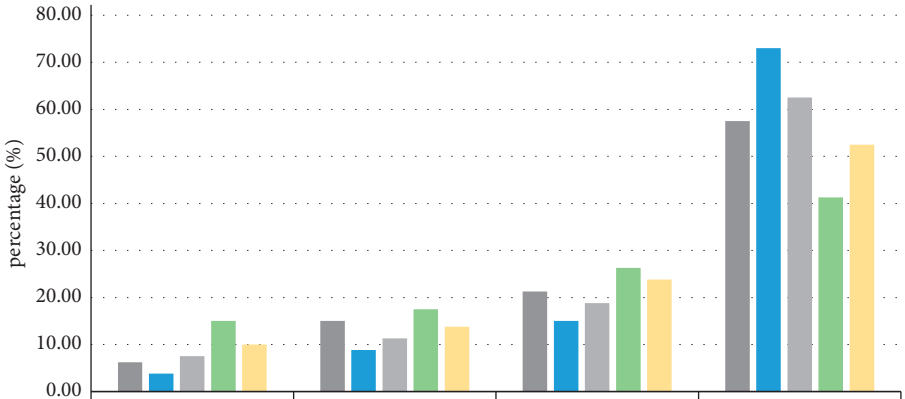


Figure 9: 376 students' perceptions of the importance of the cultivation of various teaching skill elements. The results of the questionnaire C and D University survey.

other three institutions are second-level institutions. Due to the geographical location of each school and the degree of economic development in the region, as well as the country's emphasis on it, the hardware facilities of each school are also quite different.

4. Discussion

From the factors affecting the formation of students' teaching skills, in response to the question of whether the relevant departments of each school attach importance to it,



	Very satisfied	satisfied	Quite satisfied	dissatisfied
A university	6.20%	15.00%	21.30%	57.50%
B university	3.80%	8.80%	15.00%	73.00%
C university	7.50%	11.30%	18.80%	62.50%
D university	15.00%	17.50%	26.30%	41.30%
E university	10.00%	13.80%	23.80%	52.50%

Figure 10: Satisfaction survey results of 376 students with course implementation.

although the school has adopted certain management systems and measures, few can really improve the level of students' teaching skills. Many management systems and measures are not in line with the actual situation of the school, which leads to the failure to meet the needs of students, weakens their enthusiasm for learning, and makes their attitudes become passive and neglectful. Teachers' teaching skill level, students' own learning attitude, and cognitive situation are also one of the important influencing factors. We can see the overall cognition of 376 students and 25 teachers on each teaching skill element, and their cognition will affect their poor attitude towards teaching skill learning and unclear goals. In the research, we can see the ways that students acquire teaching skills, and most of the ways they acquire teaching skills are obtained through educational practice. After investigation and interviews with experts, teachers, and students, it is found that each school arranges the students' educational practice time for a short time, which also restricts the formation of their teaching skills to a certain extent. From the statistics, we can know the curriculum settings of each school and the teaching methods, means, and content of teachers to cultivate students' teaching skills. In terms of teaching content, teachers of various majors rarely cultivate students' teaching skills. Most of the teachers teach with specialized technology as the main content, and only a small number of teachers can give consideration to all three of specialized technology, specialized theory, and classroom teaching skills, which will cause students to fail to recognize the importance of teaching skills and fail to draw attention to them. During the experiment, it can be seen that teachers' teaching methods and means are relatively simple, and such teaching methods will make students feel tired of learning.

There are too many curriculum settings and unreasonable structures in the curriculum setting, which shows that the school's teaching system is not perfect. The school's hardware and software facilities will restrict the practice and exercise of students' teaching skills. These are all important factors that affect the formation of teaching skills for students majoring in physical education. Judging from the school's assessment and evaluation, each school has not yet formed a relatively complete assessment and evaluation system, and there is no authoritative evaluation system. The specific assessment method is mainly the assessment of the special skills of the students majoring in physical education by professional teachers, and most teachers conduct a summative assessment. The second is diagnostic evaluation, the third is formative evaluation, and the frequency of evaluation is not high. Such evaluation methods make many students realize and fail to understand the importance of teaching skills training to themselves. At the same time, it is not conducive to improving the quality of the teaching process and systematically improving the relevant comprehensive skills, which also shows that each school does not pay much attention to the training of students' teaching skills.

The focus of foreign research on the cultivation of teaching skills for students majoring in physical education is to evaluate the physical education process, results, and benefits. They emphasized that the professional theoretical knowledge should be closely combined with the cultivation of practical teaching ability so as to achieve the coordinated

development of theory and technology and achieve a win-win goal. They pay attention to the education mode that combines the students' off-campus and on-campus practice, the teaching skills training method is novel, and the effect is remarkable. They mainly use multimedia teaching methods such as video, slide, and projection to strengthen the training of students' teaching skills. In addition, extracurricular training and competition are also important means of their training. Compared with foreign teaching skills training models, these phenomena and problems found in this investigation on the current situation of physical education students' teaching skills training are worthy of our pondering. These schools are relatively representative sports colleges, and their overall situation can represent the current status of the teaching skills training of students majoring in physical education. The quality of teaching skills of students majoring in physical education in colleges and universities is directly related to the future development of the physical education industry. Through this small-scale practice test, it is further confirmed that the evaluation index system of classroom teaching skills for physical education graduates designed in this paper has certain rationality and practicability, but whether it has more extensive rationality, scientificity, and practicability and whether the evaluation index system can fully realize the regulation function of the physical education graduates in the classroom teaching practice training, we still need to further test and improve through long-term practice.

5. Conclusion

This paper starts from the perspective of sports skills training in colleges and universities, and on the basis of investigation and research on the training objectives, curriculum settings, sports skills teaching methods, comprehensive quality of teachers and students, training effects, and training environment for college physical education professionals, it is necessary to study sports skills. Education majors should think rationally about the training of sports skills. The results show that, in the process of training sports skills of physical education majors, the training goal is the basis, the curriculum setting is the foundation, the teaching staff is the guarantee, the quality of the students is the key, and the hardware facilities are the premise, which are both independent and interrelated. At present, the future talents of physical education majors in major colleges and universities are mostly "compound" and "specialized" talents, and there are few references to "applied" talents. Teachers' selection of sports skills teaching methods is mostly concentrated on traditional teaching methods, and the selection of new teaching methods is less. The training goal of physical education major should be oriented to applied talents, embody the people-oriented educational concept, highlight the differences in levels and regions, and strengthen the guidance of sports skills. In view of the current phenomenon of a large number of people and few venues in some schools, schools can use WeChat and other public platforms to update the availability of venues in a timely manner, improve the utilization rate of venues, and ensure the smooth development of teaching. In this paper, only a small-scale trial is carried out for the determined index system. Due to time constraints, the evaluation system cannot be repeatedly evaluated in the process, and there may be some limitations. In order to obtain a more complete index system, it is suggested that, in future research, a larger-scale empirical study can be conducted to obtain more extensive opinions and to modify and improve the evaluation index system.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The author declares no conflicts of interest.

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