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<https://orcid.org/0000-0002-2154-2816>e-mail: vlasiuk@tnpu.edu.ua**THEORETICAL TRAINING FOR FUTURE PHYSICAL EDUCATION TEACHERS BASED ON DIFFERENTIATED APPROACH**

Effective training for future specialists in physical education and sports should be based on a comprehensive system of specialized knowledge, which is an important component of a teacher's competence. Theoretical knowledge is an essential aspect of this training.

The aim of our research was to enhance the level of theoretical training in students studying sports and pedagogical disciplines by implementing differentiated learning in the educational process.

To achieve this aim, we established the following objectives: developing criteria to assess the formation of the cognitive component and determining the initial level of theoretical training among students in sports and pedagogical disciplines, as well as experimentally testing the effectiveness of the proposed training program.

Through conducting a survey, we obtained statistically reliable data that indicate a low level of knowledge among students who entered the faculty of physical education. For instance, our results from theoretical testing revealed that 50% of the students could not correctly answer questions related to the historical aspects of physical education, while only 6% of the students demonstrated an average level of knowledge in gymnastic terminology. These results suggest that physical education teachers may not be paying sufficient attention to developing their students' knowledge system while teaching various modules of the school curriculum.

Our developed program incorporates the use of a differentiated approach when studying theoretical material. We divided study and control tasks based on levels of difficulty, enabling students to perform them according to their individual abilities and progress from simpler tasks to more complex ones.

The experiment yielded significant improvement in the level of theoretical training in both groups, with the most significant changes observed in the experimental group. Based on our findings, we can conclude that the use of a differentiated approach in the educational process effectively enhances the level of theoretical training among students.

Key words: professional training, differentiated approach, physical education, theoretical training, students.

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1. INTRODUCTION

The current urgent task is to establish suitable pedagogical conditions for implementing professional training programs for prospective specialists in physical education and sports. This ensures the effectiveness of the training process and their competency aligns with modern societal demands and higher education requirements.

As evidenced by the recent publications and research analysis, extensive attention has been given by researchers to the problem of professional training for future specialists in physical education within higher education institutions. These works cover various topics such as the theoretical and methodological principles of professional training [1, 4, 10, 11], the development of professional skills of future physical education teachers [6], and the organization of pedagogical practice for physical education students of higher educational institutions [5].

It is worth noting that special knowledge is an essential component of a teacher's competence in the field of physical education. Without

mastering the appropriate amount of theoretical material, the teacher will not be able to carry out highly productive professional activity [3, 10].

The knowledge that students possess in sports and pedagogical disciplines, particularly in gymnastics, is closely linked to practical activities. As the learning process of any action commences with the formation of a knowledge system about the technique of performing exercises, the mastery of the necessary theoretical information is a crucial stage for the successful work of future physical education teachers. They must thoroughly know and apply this knowledge in their professional activities [1, 2, 4].

2. RESEARCH CORRELATION WITH SCIENTIFIC PROGRAMS, PLANS, AND TOPICS

The study has been carried out according to the research plan of the Department of Theoretical Foundations and Methods of Physical Education in Ternopil Volodymyr Hnatiuk National Pedagogical University on the topic: "Professional and pedagogical training of future specialists for the formation of schoolchildren's

physical culture” (State registration number: 0120U103906).

The purpose of our research is to improve the level of theoretical training of students of the 1st year of the Faculty of Physical Education by using a differentiated approach.

Object. Preparation of a physical education teacher for professional activity.

Subject. Theoretical training of the future specialist.

Objectives of the study:

1. Determine the evaluation criteria and the level of knowledge of sports and pedagogical disciplines (on the example of the discipline "Gymnastics and its teaching methods" of students of the 1st year of the Faculty of Physical Education of Ternopil Volodymyr Hnatiuk National Pedagogical University.

2. Experimentally check the effectiveness of the training program and assess the state of formation of the cognitive component of the future physical education teacher.

To solve the tasks, we used the following **research methods:** theoretical analysis and data synthesis and generalization from scientific and methodological literature on issues related to pedagogy, psychology, and the theory and methods of physical education and sports, as well as methods of testing and mathematical statistics.

3. PRESENTATION OF THE MAIN RESEARCH MATERIAL

In the course of solving the research tasks, we analysed sections of the theoretical curriculum in schools [7, 8] and determined the initial level of theoretical competences in gymnastics that school graduates should possess. Those are the knowledge of the history of gymnastics, gymnastics in the physical education system of Ukraine, injury prevention in gymnastics classes, gymnastic terminology, knowledge of calisthenics, general developmental and applied exercises, and knowledge of types of physical assistance.

The research was conducted at Ternopil Volodymyr Hnatiuk National Pedagogical University, with participation of first-year students enrolled in the 2013-2014 academic year in the Faculty of Physical Education majoring in Physical Education, consisting of 36 participants.

To determine the level of formation of this knowledge, we used computer testing based on 100 questions covering theoretical concepts in the school's gymnastics curriculum. We utilized

the educational platform Moodle [9], which enables the creation of tasks with varying levels of complexity. By differentiating the tasks in this way, we were able to determine the preparedness level of each student and further differentiate them in the course of studying sports and pedagogical disciplines (SPD). We used questions of the following types:

- 1) correct/incorrect (yes/no);
- 2) built-in answers (insert missing words);
- 3) choose the correct answer;
- 4) multiple choice (several correct answers);
- 5) compliance questions.

During the testing, students answered a block of 40 questions, from which the program randomly selected 5 questions from each topic. The assessment was out of five points and was distributed among the questions depending on their complexity.

To determine the initial level of knowledge of students, we developed evaluation criteria on a five-point scale. A student who received: 0 points – has no knowledge of the theoretical concepts in gymnastics, 1 point – has a low level of knowledge, 2 points – has a below average level of knowledge, 3 points – has an average level of knowledge, 4 points – has an above average level of knowledge, and 5 points – has a high level of knowledge.

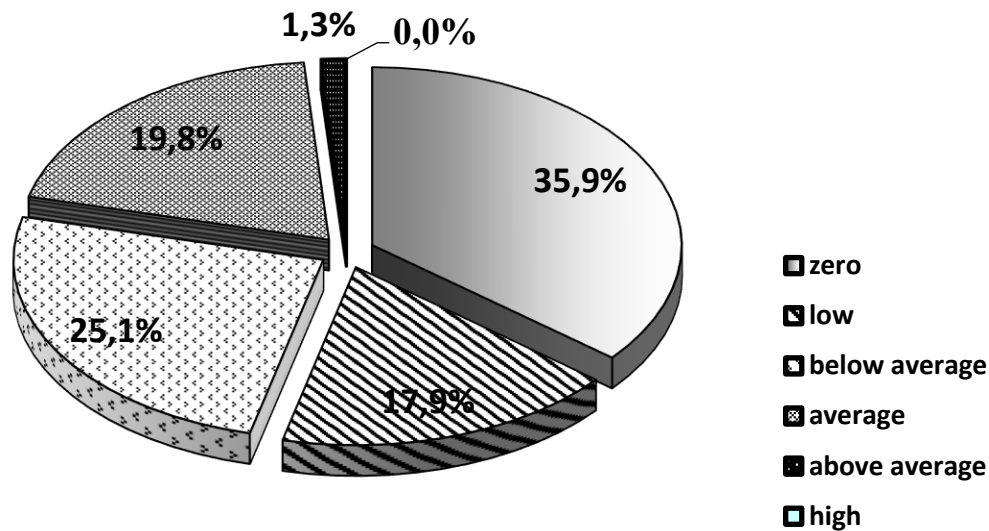
The average value of the results of testing the initial level of students' theoretical training (Fig. 1) showed that more than a third of first-year students in physical education programs (35.9%) had a zero level of knowledge, meaning they could not answer the questions.

Another 17.9% of students demonstrated a low level of knowledge. Students whose level of knowledge corresponded to below average and average received 25.1% and 19.8%, respectively. Only 1.3% of students demonstrated knowledge above the average level, and none of the students demonstrated a high level of knowledge.

For example, the results of theoretical testing of knowledge from the "Gymnastics" module of the school curriculum revealed that 50% of students could not answer the questions on the history of gymnastics. Similar results were observed in the questions on gymnastics and its place in the physical education system of Ukraine, with 58% of respondents unable to answer the questions. These results indicate that these sections of the module were not studied well by the students. Only 6% of students

demonstrated an average level of knowledge on questions related to gymnastic terminology. However, we obtained slightly better results on questions about general developmental and

applied exercises, calisthenics, injury prevention in gymnastics classes, and types of physical assistance, with an average level of awareness.



In our assessment, the students' inadequate level of knowledge suggests that physical education teachers may not be giving enough emphasis to the development of a comprehensive understanding of gymnastics among students. Specifically, the lack of involvement in performing complexes of general developmental exercises, conducting calisthenics and applied exercises, and performing individual exercises on devices may be contributing to this gap in knowledge.

The results of the research indicate that the first-year students have a low level of basic knowledge, which is considered insufficient. To ensure a high-quality educational process in the future, we need to revisit the study of the school curriculum material, and introduce a differentiated approach to the educational process based on it.

Based on the analysis of the input control of the level of specialized knowledge of future physical education teachers, we have developed an experimental methodology for preparing them to teach gymnastics in schools. We have also scientifically substantiated the ways in which this methodology can be implemented.

The theoretical training of students at the Faculty of Physical Education at Ternopil Volodymyr Hnatiuk National Pedagogical University was conducted according to an experimental program. This involved lectures, practical sessions, individual consultations, and

independent study, which were all facilitated using the Moodle educational platform.

During lectures, we employed interactive teaching methods to engage students and improve the quality of material perception. We utilized presentations, video materials, and an electronic textbook that we had developed ourselves to differentiate the presentation of educational material, which contributed to a better assimilation of the content by our students.

During practical classes, the study of theoretical material was accompanied by ongoing assessment, which was carried out through traditional methods such as oral surveys, written tests, and practical assignments. To accommodate varying levels of student preparation, the tasks were categorized by difficulty so that students with weaker preparation could select tasks that matched their abilities. Once a student had completed their assigned tasks, they could progress to the next level of difficulty.

We evaluated the level of students' knowledge using a five-point scale. A student received the maximum number of points (five) if they possessed deep, solid knowledge of gymnastics theory, could creatively and diversely apply it in non-standard situations, expressed their own opinions in a terminologically correct and articulate manner. A grade of four points was awarded if a student demonstrated a good understanding of the material, but made minor mistakes and inaccuracies in the use of terminology, as well as deviations from the

sequence of presentation. A student who knew the basic definitions, but did not fully master the material, made minor errors in the terminology of exercises, experienced difficulty in selecting examples, and violated the sequence of material presentation was awarded three points. A student who made significant mistakes during their response received a grade of two. This included instances where the student expressed their opinion unconvincingly, demonstrated confusion in gymnastic terms and concepts, and significantly deviated from the logical presentation of material. A student was awarded a grade of one if they lacked a significant understanding of the required theoretical material, made significant mistakes in defining basic concepts and terms, and provided explanations that were unclear, inaccurate, or superficial. A grade of zero was awarded when the student was unable to provide any answers to the questions.

Furthermore, students had the opportunity to assess their own knowledge by completing a self-monitoring test on the Moodle platform after studying each topic. The test consisted of 10 questions drawn from the material covered in

lectures, practical sessions, and independent study, and was divided by difficulty level. Students were given 15 minutes to complete the computer-based test.

After completing the block of topics within each module, students were required to pass a module knowledge assessment. This comprehensive assessment provided quality control of the knowledge acquired in practical sessions, individual advisory sessions, and independent study of gymnastics.

To evaluate the effectiveness of the method used to develop the knowledge system of future physical education teachers, we conducted a formative experiment. The effectiveness of the experiment was evaluated by comparing the results of tests taken by the control and experimental groups.

Below are the results of the content component of the separate variable module "Gymnastics" of the school curriculum, which reflect the level of theoretical training of students at the beginning of the experiment (the input control), and at its end (the final control), which are shown in (Table 1).

Table 1.

The dynamics of the results of testing the content component of Control Group and Experimental Group from the SPD of students of the Faculty of Physical Education

| No. | Knowledge | 2013-2014 | 2014-2016 | 2013-2014 | 2014-2016 |
|-----|--|-----------|------------|------------|------------|
| | | acad.year | acad.year | acad.year | acad.year |
| | | CG(n-184) | CG (n-184) | EG (n-192) | EG (n-192) |
| | | Mx, Sms | Mx, Sms | Mx, Sms | Mx, Sms |
| 1. | History of school curriculum modules | 1,08±0,15 | 3,31±0,13 | 1,11±0,21 | 3,70±0,11 |
| 2. | SPD in the PE system of Ukraine | 0,64±0,15 | 3,48±0,10 | 0,72±0,15 | 3,81±0,12 |
| 3. | Injury prevention | 1,56±0,18 | 3,58±0,12 | 1,58±0,19 | 3,95±0,12 |
| 4. | Special terminology | 1,03±0,17 | 3,64±0,10 | 1±0,16 | 3,94±0,11 |
| 5. | Knowledge of general developmental exercises | 1,18±0,17 | 3,47±0,09 | 1,22±0,20 | 3,78±0,10 |
| 6. | Knowledge of calisthenics | 1,38±0,18 | 3,64±0,11 | 1,44±0,20 | 3,95±0,10 |
| 7. | Knowledge of types of physical assistance | 1,72±0,18 | 3,52±0,11 | 1,75±0,21 | 3,84±0,12 |
| 8. | Knowledge of applied exercises | 1,64±0,18 | 3,44±0,08 | 1,53±0,17 | 3,73±0,11 |

The results of the final testing showed that both the control group and experimental group demonstrated improvements in their knowledge. The most significant changes were observed in the areas of injury prevention — 3,95±0,12;

calisthenics – 3,95±0,10; and special terminology – 3,94±0,11.

On the Table 2, we see the distribution of the points of the content component, in the hundred-point system.

Table 2.

Control Group and Experimental Group students according to the level of readiness for professional activity of the content component

| Groups | Number of students | Levels of readiness for professional activity | | | | | | | |
|--------|--------------------|---|-------|---------------|-------|---------|-------|--------|-------|
| | | High | | Above average | | Average | | Low | |
| | | Number | % | Number | % | Number | % | Number | % |
| CG(IC) | 64 | 0 | 0 | 0 | 0 | 9 | 14,06 | 55 | 85,93 |
| CG(FC) | 64 | 2 | 3,13 | 22 | 34,38 | 39 | 60,94 | 1 | 1,56 |
| EG(IC) | 63 | 0 | 0 | 0 | 0 | 9 | 14,28 | 54 | 85,7 |
| EG(FC) | 63 | 8 | 12,70 | 28 | 44,44 | 27 | 42,86 | 0 | 0 |

Based on the results of the testing, it can be concluded that positive and reliable changes occurred in each topic of theoretical training during the training period from September 2014 to May 2016. These changes were a result of using a differentiated approach in conjunction with advanced educational information technologies and an electronic manual, which were harmoniously combined with lectures and practical classes. It is only under such conditions that it is possible to achieve the maximum result in the process of training a future specialist in physical education and sports.

4. CONCLUSIONS

1. It can be inferred that theoretical knowledge plays a crucial role in the training of specialists in physical education and sports. Moreover, the acquisition of fundamental knowledge of gymnastics is essential in the cycle of sports and pedagogical disciplines;

2. The results of the test conducted to measure the theoretical readiness of students who have just started their first year suggest a low level of knowledge in the "Gymnastics" module of the school curriculum. In response to this, we have proposed an experimental program based on

differentiated learning to form the system of knowledge of sport and pedagogical disciplines. The program includes lecture, practical, individual-consultative, and independent classes, along with the use of information technologies, an electronic manual, and the Moodle educational platform. The combined effect of these techniques facilitated better learning and understanding of the educational material by the students.

3. The final test results demonstrate the effectiveness of the proposed program, with statistically significant changes in the measured indicators. Notably, the program has led to significant improvements in knowledge, specifically in general developmental exercises (4.22 ± 0.12), calisthenics (4.11 ± 0.10), injury prevention in gymnastics classes (4.17 ± 0.12), and gymnastics in the system of physical education in Ukraine (4.03 ± 0.15).

Prospects for further research consist in the further development of science-based technologies, a combination of theoretical and methodical training of future specialists in physical education and sports during the study of sports and pedagogical disciplines.

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Abstract
ВЛАСЮК Роман

ТЕОРЕТИЧНА ПІДГОТОВКА МАЙБУТНЬОГО ВЧИТЕЛЯ ФІЗИЧНОЇ КУЛЬТУРИ НА ЗАСАДАХ ДИФЕРЕНЦІЙОВАНОГО ПІДХОДУ

Ефективна підготовка майбутнього фахівця з фізичної культури і спорту повинна опиратись на цілісну систему спеціальних знань, які є важливою складовою компетентності вчителя. Саме теоретичні знання, є важливим компонентом цієї підготовки.

Метою нашого дослідження було покращити рівень теоретичної підготовки студентів зі спортивно-педагогічних дисциплін через впровадження у навчальний процес диференційованого навчання.

В ході дослідження нами були поставлені такі завдання: розробити критерії оцінки сформованості пізнавального компоненту та визначити початковий рівень теоретичної підготовки студентів зі спортивно-педагогічних дисциплін. Експериментально перевірити ефективність запропонованої програми навчання.

В ході дослідження, шляхом проведення опитування отримано статистично достовірні дані, які свідчать про низький рівень знань студентів, що вступили на факультет фізичного виховання. Для прикладу результати теоретичного тестування виявили, що на питання, які стосуються історичних аспектів фізичної культури 50% студентів не змогли дати правильної відповіді, схожі результати ми спостерігаємо у питаннях гімнастичної термінології де лише 6% студентів відповідають середньому рівню знань. На нашу думку такий рівень знань свідчить про те, що вчителі фізичної культури в ході вивчення різних модулів шкільної програми мало приділяють увагу формуванню в учнів системи знань.

Розроблена нами програма передбачала використання диференційованого підходу під час вивчення теоретичного матеріалу. Завдання для вивчення і контролю було розділено за рівнями складності, що дало змогу студентам виконувати їх відповідно до своїх можливостей і таким чином рухатись від простіших завдань до складних.

За результатами експерименту відбулось достовірне покращення рівня теоретичної підготовки у двох групах. Більшими зміни були у експериментальній групі. Зважаючи на результати дослідження ми можемо констатувати, що використання диференційованого підходу у навчальному процесі сприяє покращенню рівня теоретичної підготовки студентів.

***Ключові слова:** професійна підготовка, диференційований підхід, фізичне виховання, теоретична підготовка, студенти.*

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