Pedagogical Strategies – A Progress Factor in the Acquisition and Improvement of Gymnastics-Specific Motor Skills in Highschool

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Abstract: - Pupils’ progress in the lesson of physical education is the main objective of any teacher, who is constantly looking for the right didactic methods, exercises and organisation forms able to captivate the pupils, motivating them and increasing their performances. That is why the main purpose of this paper was the acquisition and consolidation of the gymnastics-specific motor skills by selecting and applying pedagogical strategies and finding stimulating assessment tools. As a result of the pedagogical experiment proposed, it was found that the training group where the pedagogical strategies were implemented progress was more considerable than in the control group where the teaching methods remained unchanged.

Key-Words: - increased efficiency, physical education, motor skills, acrobatic gymnastics, gymnastics-specific leaps, pedagogical strategies, didactic methods, exercise

1 Introduction

A pedagogical strategy prepares the most logical and effective methodological path to be covered in approaching a succession of concrete situations of teaching and learning. Its main purpose is to put pupils in contact with the new contents to be studied, which presupposes the use of methods, means and forms of organisation in order to enable competence (knowledge) acquisition at a higher quality level [6, 11, 12, 13].

Seen as a didactic scenario with a complex structure, the pedagogical strategy mostly eliminates hazard and prevents errors, risks and undesired events in practice. The focus lies not only on the manner of guiding the pupils, but also their behaviour in an actual learning activity. However, to achieve a flexible relation between the pupil’s actions, the teacher has to take into account the bio motor potential, motivation, capacity to act in a certain manner and operate with certain categories of data, training level, learning style, etc [1, 5, 7].

The present paper aims at presenting the possibilities of application of certain pedagogical strategies (programmed instruction, problematisation and algorithmisation) in the physical education lessons on gymnastics topics. The authors’ intent is to present the results obtained by using pedagogical strategies in learning and consolidating certain acrobatic elements and specific leaps, underlying the fact that their application led to fulfilling the contents and operational objectives assumed in the subject curriculum at a higher level in the training group.

2 Problem Formulation

It was supposed that by drafting and putting in practice the pedagogical strategies selected within the physical education lesson on gymnastics topics the educational process in highschool will become more efficient, visible by: increasing the quality of acquisition of the didactic contents of the curriculum for the subject ”Physical education” in gymnastics (through didactic strategies).

3 Methods

3.1 Participants

In order to determine the efficiency of implementing the proposed strategies in the physical education lesson centred on gymnastics topics, a pedagogical experiment was used: the control group went through the school curriculum without any
special intervention, while the training group used didactic strategies within the lesson systems (number of lessons) to acquire, strengthen and consolidate gymnastics-specific motor skills. To achieve the objective, the experiment made use of research methods such as the testing method, the experts’ method and statistical –mathematical methods.

The experiment took place in the “Costache Negri” National College of Galați on two groups consisting of 62 pupils (the control group), and 61 pupils (the training group)—two 9th grades for each group — during a school year, according to the curriculum divided into 2 semesters as follows: acrobatic gymnastics in the second semester (14 lessons) and gymnastics-specific leaps in the first semester (10 lessons).

3.2 Research methods

In order to examine the complex specific aspects of the character and content of highschool physical education lessons, the following methods of research were used, thus evincing the effects of a new methodological approach regarding the applicability of pedagogical strategies in the physical education lesson.

The testing method

In assessing gymnastics, our option went to acrobatic gymnastics, thus testing 5 static and dynamic acrobatic elements for girls and boys: forward roll from a sit-up to a wide position, handstand; cartwheel; bridge (girls); headstand (boys); backward roll with the body bent and the legs close together (girls); backward roll with a straight body and legs close together (boys), tucked in vault over the vaulting horse (girls) and tucked in vault on the longitudinally-oriented vaulting platform (boys).

The assessment of the static and dynamic acrobatic elements was performed as follows: for each acrobatic element the pupils received a mark and then those marks were averaged, thus reflecting the level of acquisition of the acrobatic elements’ technique (the evaluation was performed by a group of experts—three teachers).

In acrobatic gymnastics, marks are given in the following manner:

- Pupils opting for the execution of isolated elements are granted a maximum mark of 9;
- Pupils opting for the execution of elements connected into a continuous floor exercise may receive a maximum mark of 10.

The statistical–mathematical methods — allow the description of the characteristics of the correlated data, testing the relation among various data groups (variables) as well as testing the differences among them.

Using the statistical means to test the differences between the groups, it may be seen if these groups are significantly different, but at the same time, it is possible to acknowledge the degree of association between dependent and independent variables, as well as the size of the difference between the groups. The means to assess the importance of the difference between the groups are:

- The dimension used to estimate the degree of association between independent and dependent variables;
- The dimension of the ES effect assessing the standard difference between the two groups.

The tables of $t$ numbers were used to see if the groups involved in the research are significantly different or not.

The paper employed as a determination method of the differences between the groups the Student ($t$) test.

The statistical – mathematic indicators used in analysing the data obtained by measurement were: the arithmetic average, dispersion, average quadratic deviation, variation coefficient, and average error.

The significance tests start from the null difference hypothesis, presupposing that there are no significant differences between the poll values and the population parameters, or between the poll values of two random samples.

To make this comparison is statistically determined (the Student test). The hypothesis is accepted and the differences are considered significant if $t \geq t_{cr}$ (signification threshold 5%).

3 Procedure

Starting from the general objectives of physical education, lesson organisation, in point of contents elements, should take into account the methodology necessary to acquire, consolidate and improve the motor skills and abilities specific to certain sports branches.

To this purpose, interventions were performed on programming, and activity planning in the physical education lessons on topics pertaining to acrobatic gymnastics and leaps, at highschool level, according to the model of annual design of the learning units and pedagogical strategies shown in Table 1. Tests were used to highlight the efficiency of the use of these pedagogical strategies in the physical education lesson.

Acrobatic gymnastics represents the thematic contents in the curriculum which is no longer as attractive and satisfactory in point of results in...
highschool as in secondary school. As the level of execution of gymnastics elements, either static or dynamic, is dependent on the level of priority development of motor skills (strength-mobility), specific means were programmed before and during the acrobatic gymnastics thematic cycle in order to develop these skills and facilitate the teaching-learning process of gymnastics elements.

Under the topic gymnastics the curriculum, states the choice of two different leaps, according to gender and the sports equipment available and the indoor activity interval, which were taken into account at the moment the learning units were scheduled.

Table 1 Didactic Model of the annual design of learning units and pedagogical strategies in acrobatic gymnastics –9th grade

<table>
<thead>
<tr>
<th>Reference objectives</th>
<th>Semester/ hours</th>
<th>Didactic Strategies</th>
<th>Methodological methods and procedures</th>
<th>Contents</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquisition of the basic mechanisms for the following acrobatic elements: forward roll from a sit-up to a wide position; handstand; cartwheel; bridge (girls); headstand (boys); backward roll with a body bend and legs close together (girls); backward roll with the straight body and the legs close together (boys). Consolidation of acrobatic elements (separately or in structures) according to the individual possibilities.</td>
<td>II/ 14</td>
<td>Method of explanation; Method of demonstration; Method of practice; Methods of correcting the execution errors; Method of assurance and support.</td>
<td>Exercises to learn the technique of each procedure, until the basic mechanism is acquired.</td>
<td>Predictive and summative observation</td>
<td>Systematic and summative observation</td>
</tr>
</tbody>
</table>

Supported vaults I/ 10

<table>
<thead>
<tr>
<th>Program 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward roll from a sit-up to a wide position (acquisition)</td>
</tr>
<tr>
<td>- From a sit-up position with the arms stretched forward – the body leans forward and the palms are placed on the floor.</td>
</tr>
<tr>
<td>- The same moves with thrust forward in the toes, return to the initial position</td>
</tr>
<tr>
<td>- In a sit-up position, palms at the level of the knees/ calves, backward roll with the body tucked in, return to the initial position.</td>
</tr>
<tr>
<td>- The same moves in the sit-up position, arms stretched forward, return to the initial position.</td>
</tr>
<tr>
<td>- Hand support (as far as from the legs support as possible) Body load to the level of the hands of the neck</td>
</tr>
<tr>
<td>- Emphasis on bringing forward the chest and shoulders</td>
</tr>
<tr>
<td>- assistance from the teacher</td>
</tr>
</tbody>
</table>

Algorithmisation

Program 2

Problematisation is considered as the most valuable pedagogic strategy as it may be applied to all school subjects and especially physical education, being a variant of heuristics, viz. an implementation of the method of learning by discovery [2, 8, 10].

Certain experts see it as a "method", others as a "principle". Regardless of these opinions, it is certain that problematisation develops creative thinking, imagination, interest, curiosity and other abilities the pupils should possess.

As it has been shown [14], by problematisation the teacher creates a conflictual state between the
knowledge level and the potential of the pupil, and hence learning by problem solving as a method is in fact a well thought experiment, problem situation, which at the same time serves as hypothesis, according to [4].

It is recommended to use a series of steps in the implementation of problematisation:

- The teacher helps the pupil in solving the problem;
- The pupil cooperates with his classmates in solving the problem;
- The pupil solves the problem on his own.

In physical education the following directions of problematisation are applied:

- Selecting, restructuring and reorganising the knowledge and skills the pupil possesses (applicative track, tactical combinations, technical procedures in gymnastics);
- Formulating a problematic situation, that can be solved in more ways than one. The teacher may suggest solutions, and the pupils choose the most effective;
- It is possible for the teacher not to suggest any solution, and the pupils select the best solution according to their possibilities.

As an illustration of problematisation, upon consolidating the technical elements in acrobatic gymnastics, the pupils were supposed to make up an acrobatic line by means of the elements previously acquired, and shown in Table 1.

Algorithmisation consists in a process of devising learning algorithms of various types. Specialised literature [3, 6, 7] mentions the following types of algorithms:

- Algorithm specific to the contents of the educational process;
- Algorithm specific to the teacher’s activity;
- Algorithm specific to the pupil’s activity.

An algorithm presupposes a certain sequence of operations aimed at solving typical standardised situations.

In the field of physical education the aspects referring to the algorithms specific to the contents of the educational process are clearer. Such an algorithm consists in practising the most efficient moves, arranged in a certain sequence, which is well determined, logical and well quantified in point of effort. The algorithm of this type is an operational model or a sequence of operational models as shown in Table 3.

Table 3 Algorithmisation design for the acquisition/consolidation of gymnastics-specific leaps

<table>
<thead>
<tr>
<th>Pedagogical Strategy</th>
<th>Means</th>
<th>Dosage</th>
<th>Methods of teaching-learning, assessment, methodological directions and work formations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tucked in vault over the vaulting horse (girls)</td>
<td>Individual and group practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Running with ankle warm-up, aiming at the complete stretch of the support leg from the knee joint.</td>
<td>2X20m</td>
<td>- Demonstration</td>
<td></td>
</tr>
<tr>
<td>Running with jumping step, alternately pushing the legs by the strong extension of thighs and ankles.</td>
<td>2X 15m</td>
<td>- correction</td>
<td></td>
</tr>
<tr>
<td>Running with backward calf swinging.</td>
<td>2x20m</td>
<td>- appreciation</td>
<td></td>
</tr>
<tr>
<td>2-3 steps running (jumping steps) at the same time with the forward lift-up of the arms.</td>
<td>3X10m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 repeats</td>
<td>Pause 35”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 repeats</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 repeats</td>
<td></td>
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<tr>
<td>Tucked in vault on the longitudinally oriented vaulting platform (boys).</td>
<td>Individual practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The same exercises as above to achieve run and take-off.</td>
<td>3 repeats</td>
<td>- Demonstration</td>
<td></td>
</tr>
<tr>
<td>Roll from a sit-up to a sit-up position.</td>
<td>3 repeats</td>
<td>- assistance</td>
<td></td>
</tr>
<tr>
<td>Forward roll from a sit-up position on the gym bench (at various heights).</td>
<td>3 repeats</td>
<td>- correction</td>
<td></td>
</tr>
<tr>
<td>Roll from a sit-up position on the gym bench and floor landing.</td>
<td>3 repeats</td>
<td>- appreciation</td>
<td></td>
</tr>
<tr>
<td>Forward roll, from a jump in place, on overlapping mattresses.</td>
<td>3 repeats</td>
<td>- observation</td>
<td></td>
</tr>
<tr>
<td>Same exercise, with 5 step run, emphasising the leg work.</td>
<td>Pause 35”</td>
<td></td>
<td></td>
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</tbody>
</table>

4 Results and discussion

By the comparative analysis of the initial and final test results of the acrobatic gymnastics-specific motor skills, it may be seen that both the training and the control group obtained quite similar results in the initial test, but at the end of the experiment the training group prevails over the control group. The results in Table 4 show that in the acrobatic elements test the progress made by the control group was 9.33% (girls) and 9.10% (boys) as compared to the progress made by the training group which was 17.45% (girls) and 16.71 (boys).
As a result of the comparative analysis on the level of motor skills acquisition by the pupils taking part in the experiment, the pedagogical experiment showed that in all tests the training group obtained better indices than the control group (P<0.05), which proves that by applying pedagogical strategies the average marks in the training group were above 8 as compared to the marks obtained by the control group, where the average was 7.50.

Table 5 and Table 6 shows that in the initial test both groups were quite similar in value, the difference occurring in the final test where the average marks obtained by the training group were higher than the control group; therefore, it may be concluded that the implementation of pedagogical strategies helped improve the technique of acrobatic elements and specific leaps, thus making a comparatively significant progress as compared to the initial test.

5 Conclusion

By the analysis of the results obtained in the pedagogical experiment, it may be said that the high school pupils’ training level is between average and poor according to the model in the National System of Assessment and Appreciation. Thus it may be seen that in the initial test of gymnastics-specific motor skills both girls and boys obtained an average mark below 7, i.e. average level, which proves poor physical and motor training.

Upon applying the pedagogical strategies, the results of the experiment prove that the pupils in the 9th grade (within the interval of research) made progress in the motor training, the level of motor skills formation, and their attitude towards the physical education lesson.

These results lead to the conclusion that the tendency of increasing effectiveness in the physical education didactic process through the application of pedagogical strategies makes the pupil grow aware of the objectives proposed in the physical education lesson. These objectives may be attained only by stressing the cognitive process, in order to inculcate in pupils stable convictions referring to the systematic practice of physical exercises contributing to the acquisition of motor skills specific to a certain sport branch, the development of basic motor skills, and the display of positive attitude towards the activity in the physical education lesson.

References:


