

ABSTRACT OF THE DOCTORAL THESIS

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Thesis Title: **OPTIMIZING THE SPORTS SELECTION AND ORIENTATION PROCESS BY USING INFORMATION APPLICATIONS**

Key words: sports, information, software, screening, evaluation, diagnose, prognosis, selection, sports counseling, pre-orientation, reorientation, optimization.

Present in a constantly increasing proportion in the education process, the optimization of its different sides has represented for a long time the concerns and thematic of many research studies in different fields.

The hereby PhD Thesis represents a study of the problem of optimizing the sports screening, selection and orientation process, by the adequate use of information and communication technologies.

The work familiarizes the potential beneficiaries with the use of the computer in the sports selection and orientation process as a *sports data and information collection, storage, management and processing environment*, mainly focused on the *user – PC dialogue*.

The need for research was imposed especially now, when the high performance sports reached hard to imagine levels, with multiple implications and valences: biological, social-economical, psychological-pedagogical, technological, informational and ethic.

This was also dictated by the polemics between specialists, with different visions, focused on the acceptance or rejection of the ideas regarding the role of information applications in the sports field.

In this context, the identification of the children with real potential for practicing high performance sports has become an increasingly complex process, often difficult to be controlled and optimized.

Taking into consideration the necessity to involve an as large as possible number of specialists in the above mentioned issues, by our scientific endeavour we wanted to clarify and approach the main concepts and characteristics of the information applications capable to optimize the sports selection and orientation process, but also the general manner of performance of the information programs included in its content.

The purpose of the research was represented by the optimization of the sports selection and orientation process at the level of the sections of the Ilfov School Sports Club, by using information instruments, the adaptation of the sports counseling and diagnose services.

The objectives of the research were aimed at:

- Obtaining pertinent and valid information, which can contribute to the optimization of the sports selection and orientation process, through investigations made on the organization and functioning of Ilfov School Sports Club;

- Evolution analysis - theoretical and practical - of the technical training means in the context of contemporary information technologies, of the implementation and development trends and the performance of the sports selection and orientation;

- Elaboration of the application “PSOsport v.1.0” - information collection, management and generation process in view of optimising the sports selection and orientation process.

- Experimental argumentation of the efficiency of using the application “PSOsport v.1.0”.

The scientific endeavour was represented by *three hypotheses* tightly connected to the objectives of the research, formulated as follows:

- a) The systematic diagnose and the examination of the options and action scenarios at the

level of the education units in the sports field, contributes to the identification of the manners in which the efficiency of the sports selection and orientation process can be improved, eliminating the risk of abandon recorded in the process.

b) Sports counseling represents an important component of the screening/selection and orientation-reorientation activity, contributing to the process optimization, by supporting the child to choose the adequate sport for his/her skills profile.

c) The sports selection and orientation process can be optimized by using an information instrument, based on the information and communication technology, creating a favourable context for the sports practicing students to remain in the system and to obtain higher performances.

The object of research was represented by the elaboration of a work which analyses the possibilities to optimize the sports selection and orientation process, having as support diagnose, sports counseling, information and communication technologies.

The subject of the research consisted of the information applications implementing technology in the sports selection and orientation activity.

The scientific innovation of our endeavour consists, on the one hand, in *creating a specialized application - "PSOsport v.1.0" - with functions and competences in the line of generating predictions regarding the chances of a child to obtain high performance in a sports discipline*, and on the other hand, in the *examination of the manners to integrate the information systems in the sports selection and orientation activity*, as well as in the approach, definition and application in the selection and orientation activity of the sports counseling concept.

The main theses of the research were represented by the design and application of information programs in the sports selection and orientation area, the adaptation and application of the data base management systems in the sports field, as well as the objective approach of evaluating the efficiency of the application "PSOsport v.1.0", by the statistic and mathematical analysis of the data obtained at the conclusion of the experimental activity.

Significant parts of the studies and research data represented the thematic support of debates and speeches attended by specialists who are active in the sports field, preoccupied by developing the above mentioned sports disciplines.

Intended as a reference endeavour in the problematic of optimising the sports selection and orientation process, by using the information applications, the work was structured into 3 parts and 10 chapters.

Part I, preceded by a short introduction, which presents the novelty and the level of research of the investigated theme, it includes the *theoretical, methodological and conceptual grounds, regarding the sports selection and orientation*. Has a structure of six chapters, in which the following aspects are approached:

- *Considerations regarding the motivation for choosing the theme and aspects regarding the methodology of research;*
- *Characteristic and conceptual aspects regarding the sports selection and orientation;*
- *Diagnosis in high performance sports;*
- *Decision making act regarding practicing a sport;*
- *Coordinates of evaluation in movement activities;*
- *Use of information and communication technologies;*

Part II contains the *preliminary research regarding the current stage of the sports selection and orientation at the level of the Ilfov School Sports Club*. It has in its structure an ample chapter in which the following aspects are approached and studied:

- *Preliminary considerations regarding the scientific endeavour;*
- *Diagnosis of the current sports selection and orientation stage at the level of school sports club;*
- *Sports counseling - important component of the sports selection and orientation process*

In this part, the scientific endeavour involved the progress of two main stages, connected between them logically, according to the manner in which the scientific endeavour, the reaching of the objectives and the solving of the tasks connected in a strictly hierarchic order were started.

I. In a first stage, by means of the diagnosis it was intended to obtain pertinent and valid information which could contribute to the optimization of the sports selection and orientation

process, by investigations made on the organization and functioning of school sports club, the main objectives being:

a. the identification of the current activities, specific to the sports selection and orientation process at the level of the additional sport program education institution;

b) identification of practices specific for the selection and orientation activity in view of their selection, adaptation and transformation into an *Action Plan regarding the Sports Selection and Orientation – „PASOS”*.

The working hypothesis of this stage was the following: systematic diagnose and examination of the options and action scenarios contribute to the identification of the manners in which the effectiveness of the sports selection and orientation process can be improved, eliminating the risks of abandonment recorded in the process.

The diagnosis tasks were aimed at:

a) studying the concepts regarding the theory and practice of the sports selection and orientation system;

b) appreciation of the contents of the selection and orientation process in the supplementary sports education;

c) the cause-effect analysis in view of identifying the positive and negative points bet during the sports selection and orientation activity;

d) elaboration of the cause-effect report used for formulating the recommendations;

e) objective identification of the positive and negative relations in the analyzed system; correlation between causes and recommendations.

f) processing and interpreting data.

g) completion of the diagnose by conclusions and recommendations.

Techniques used:

- Diagnosis of the sports selection and orientation process, by SWOT analysis.

- Scores of ideas (for collecting preliminary information).

The contents of the strategic analysis observed the characteristic objectives of such an approach, with details of the level, structure and dynamics of the activities, the influence of the main factors, the impact of opportunities and of external threats.

The careful and detailed analysis made in the diagnosis fully motivated, through significant conclusions, the orientation of the activity design within school sports club, to three important directions:

a) consolidation and valorization of the strengths and opportunities;

b) reduction of the force by which the weaknesses and threats acted;

c) amelioration of less satisfactory results.

For this purpose, priority, general and specific objectives were established, and based on them was designed an *Action plan regarding the sports selection and orientation activity* which offered the possibility to concretely monitor the planned activities and sequences.

The results obtained following the performance of the diagnosis were recovered in two directions:

- Establishment of the structure “*Action plan regarding the sports selection and orientation activity – „PASOS”*”

- The identification of the role of diagnose and the manners to recover it in the sports selection and orientation activity.

II. In stage II, by the recovery of sports counseling we wanted to show the role which it can have in determining the choices children make when they orient themselves towards a sports discipline.

At this time of the research, it was reached the conclusion that *the rightfulness of the choices can be evaluated, among other things, by studying the relations existing between the interests expressed towards a certain sports discipline and the specific skills necessary for obtaining the performance in the respective sport.*

In other words, the problem can be raised in the terms of the *compatibility of the skills and individual motivational profile of the child with the specific of the selected sports discipline (the overlapping degree between the skills profile of the child with the current pattern of the performer for the respective sport).*

The working hypothesis of the present stage was the following: the sports counseling

represents an important component of the selection and orientation-reorientation activity, contributing to the process optimization by supporting the child in choosing the sport adequate to his/her skills profile.

The investigation was addressed to children in education institutions in the Ilfov county, to the parents and specialized teachers, who, in their practice, became involved directly and indirectly in the sports selection and orientation process. In total, 250 subjects were investigated, of which: 100 students, 100 parents and 50 specialized teachers.

In order to show the importance of counseling in the decision making process regarding the practice of a sport and the manner in which this activity can lead to the optimization of the selection and orientation process, it was necessary to know if there is a correlation between the answers to identical questions of the questionnaires applied to the three categories of subjects.

The personalized questions had as purpose the identification of the need for sports counseling and the coordinates specific for each category of potential beneficiaries.

Following the processing of the results, analyzing the information and correlating them with those obtained in the previous stage, the following appreciations were formulated:

- the criteria according to which children orient themselves in view of practicing a certain sport are subjective, the decision to practice a sport being influenced especially by the parents, friends, teachers/coaches;

- the degree of awareness of the need for sports counseling is felt different by the potential beneficiaries; children feel this need but it is not sufficiently conscious, and the younger they are, the lower the awareness degree is;

- the parents and the teachers are much more aware of the importance of counseling services at the time of sports orientation or reorientation, but they do not have specific competences developed for this type of counseling;

- in the sports orientation and reorientation process, knowing the correlation level between interests, aspirations and skills is essential for the identification of the most compatible sports profiles with the individualized profile of the child;

- *most times, at the moment of making the decision to practice a sport, children do not benefit from specialized counseling services in view of orientation; the influences are exercised informally by the parents, close relatives or other persons in the entourage of the child, who do not have the competences, knowledge and instruments necessary for identification, in a scientific manner, of the most compatible sports disciplines with the individualized profile of the child.*

Partial conclusions of the scientific endeavour

- By the systematic diagnose of the important aspects, the examination of the options and of the action scenarios, the specialists and the decision making factors in an education unit with sports profile can destructure and restructure the classic practices which prove to be inefficient, non-lucrative, or counterproductive in the sports selection and orientation process.

- In order to facilitate the guarantee of suitable sports selection and orientation strategies, the SWOT analysis has to review the origin inventories in order to find those where they are reflected, with sufficient precision, what is anticipated to be strengths, weaknesses, opportunities and threats.

- The SWOT strategic analysis has to be used permanently, even if there is already a strategic plan of the education unit.

- The internal and external environments have to be examined periodically by the manager of the education unit, using modern methods and means, intensely exploiting the virtually infinite potential, offered by the applications based on the information and communication technology.

- The choice of the optimization strategy of the sports selection and orientation process has to be based on a future anticipated situation, not on the analysis of the current situation or on a past situation.

The sports counseling can considerably improve the efficiency of the sports selection and orientation process, eliminating the risks of abandonment / failure recorded in the process.

- The option of a child to practice sports disciplines, without any external support is a difficult process, often associated with postponements, hesitations, mistaken choices, abandonment.

- The behaviour models related to the participation of a sports discipline, promoted in the family - of appreciation or, on the contrary, of depreciation of certain sports, will also be taken over by the children, gradually contributing to the outlining of the choices.

- The sports counseling has to represent an organized, structured professional undertaking, with specific means and techniques, being recommended to all persons, irrespective of age, who wish to practice a certain sports discipline, to reach a superior life level, to overcome certain obstacles.

- The central scope of sports counseling is that of helping the sports person to explore the manners of effective recovery of the physical and psychical resources in order to adopt a "healthy life style".

- In order for the sports selection and orientation process to benefit from maximum success chances it is necessary that the "choosers" take into consideration the following aspects:

a) physiologic requirements and characteristics of the sports disciplines;

b) biologic model of the performer;

c) the stages of growth and ageing of the human body and of the morphologic substrate of basic bio-movement qualities, as well as of the psychical and intellectual qualities;

d) stages of sexual ageing: pre-puberty, puberty and post puberty;

e) genetic characteristics sent hereditary from parents to descendants:

- stable genetic qualities, less influenced by the physical effort (longitudinal dimensions of the body and segments, speed, ability etc.);

- labile genetic qualities, strongly influenced by the physical effort (body weight, perimeters, force and resistance etc.);

f) the acceleration phenomenon of the children growth and ageing process.

Part III, fundamental for the entire scientific endeavour, contains the *research and personal contributions regarding the optimization of the sports selection and orientation process, at the level of the Ilfov School Sports Club, through the use of information applications*. This part is structured on two chapters.

The first chapter in this part was allocated to the problematic regarding the *optimization of the sports selection and orientation process by using information and communications technology (information applications)*, in its structure being found the following subchapters:

1. *The impact of using the applications based on the information and communication technology (information applications) in the sports selection and orientation process;*

2. *Information application for the optimization of the sports selection and orientation process;*

3. *Comparative statistic results of sports selection and orientation - reorientation parameters obtained before and after the experiment*

4. *Comparative analysis of the results and the statistic interpretation of data and information.*

In this stage of the scientific endeavour, the purpose of the research was aimed at *showing the manner in which the sports selection and orientation process can be optimized by the adequate use of information applications, the working hypotheses being the following:*

a. The sports selection and orientation process can be optimized by using a specialized instrument, of software type, based on the Information and Communications Technology.

b. By using the application „PSOsport v.1.0”, we can create a favourable context for the sports pupils to remain in the system and implicitly to obtain higher performance.

The investigated sample consisted of 298 children, 112 girls and 186 boys, aged between 8 and 18 years, from within the four sports sections of Ilfov School Sports Club.

The main methods used during this study were:

- The psycho-pedagogic proving experiment (stage I) was aimed at „photographing” the sports selection and orientation activity performed in the prior to the experiment;

- The psycho-pedagogic formative experiment (stage II), during which I introduced three progress factors: diagnose, sports counseling, the PSOsport v.1.0 application;

The main research instruments used:

- The “PSOsport v.1.0” application - information collection, management and generation program in view of optimizing the sports selection and orientation process;

- The Personal Electronic Form of the Sports Child - FEPS;

- Questionnaire for children, professors, parents.

The succession of events within the research determined the establishment of a general working procedure, consisting of:

- a) performance of the pilot experiment;
- b) the registration of preliminary data and information about the children/students;
- d) processing and classification of information in view of establishing the skills individualized profile of the children;
- e) completion of the application „PSOsport v.1.0” and the establishment of its manner of use in the information collection, management and generation process, in view of optimizing the sports selection and orientation process;
- f) the use of the ”PSOsport 1.0” application within the confirmation experiment.

With the help of the information application “PSOsport v.1.0” (**Program for Sports Selection and Orientation**), information collection, management and generation process, we have succeeded to effectively intervene in the selection and orientation activity, proving a lot of mobility, clear vision and at the same time rigorous prognosis, the obtained results consisting of:

- a) given in the form of structured reports, containing information about sports children and other characteristics of events in their life;
- b) specifications referring to the constitutional biotype, norms, indications, selection criteria and parameters described in the specialized literature (biological model of the performer).

The entire volume of information regarding the sports selection and orientation process was introduced in the contents of the application we designed, the data being incorporated selectively, in an accessible language for the electronic computer, both in the functional block of the application and in its memory unit.

In order to meet the need for accuracy and to eliminate the equivocal from the estimation procedure of information and parameters about sports children, we designed the Personal Electronic form of the Sportsman (FEPS), which we integrated, in the form of modules, in the “PSOsport v.1.0 application.

The data obtained during the experimental activity allowed the quantitative and qualitative comparison of the dynamics of inputs (records, legitimating) and outputs (abandonment) in the system (education unit), as well as the evolution of the batch of subjects on the main *criteria considered relevant for the appreciation of the sports selection and orientation activity*:

- a) total number of requests of registration for each sports section;
- b) total number of children rejected for medical reasons;
- c) total number of children registered at the start of the school year;
- d) total number of children oriented towards another sports discipline, at the start of the school year;
- e) total number of students reoriented to another sports discipline at the end of the school year;
- f) total number of students withdrawn from the sports section;
- g) total number of students remained in the sports section at the end of the school year;
- h) total number of students remained in activity at the end of the school year;
- i) total number of sports qualifications;
- j) total number of sports students transferred to senior sports clubs;
- k) total number of sports students promoted to national teams, senior sports clubs etc.

The purpose was the evaluation of the optimization level of the sports selection and orientation process in the period of experiment, compared with the period before experiment, following the recovery of the diagnose results, the sports counseling services and the use of the information application PSOsport v.1.0.

The research data obtained at the level of the sample answered to our questions, confirming the mentioned hypotheses. The results confirmed that the progress of the main performance indicator - **the efficiency degree of the sports selection and orientation activity** - in the period of the experiment was due to the use of the information application - PSOsport v.1.0 -, recovery of the diagnose and sports counseling services.

The first working hypothesis, referring to the role of the diagnose, was fully confirmed, *the systematic diagnose and the examination of the options and action scenarios at the level of the Ilfov School Sports Club contributing fully to the identification of the manners of improvement of*

the sports selection and orientation process, considerably eliminating the risks of abandonment recorded in the process.

The second working hypothesis in the scientific endeavour, referring to the sportive counseling was also confirmed, *the sports counseling services offered to children and parents represented an important component of the selection and orientation-reorientation activity in the experiment period, contributing to the process optimization, by supporting children to chose the adequate sport for their skills profile.*

The third working hypothesis was checked during the three years of experiment and confirmed, *by using the application “PSOsport v.1” the sports selection and orientation process at the level of the sport club was optimized, creating favourable circumstances for the sports students to remain in the system and to obtain higher performances than in the period before experiment.*

The PhD thesis is concluded with the **second chapter of part III**, containing the *final conceptual, theoretical and methodological conclusions induced by the results of the studies and of the research.*

GENERAL CONCLUSIONS

Analyzing the data and information resulted following the two preliminary studies and the research in the fundamental part, we can state that, indeed, the option for a sports discipline has to be regarded as an expression of the child personality who, when selecting a sports discipline or another, he/she in fact chooses a way of life, a role and a certain status.

From this perspective, one of the important objectives of the scientific endeavour was **to determine the degree of congruence between the skills profile of the child with the choice made by the latter for a certain sports discipline. The higher the congruence (overlapping) degree was, the higher was the chance of satisfaction, stability and success.**

Following the proving psycho-pedagogic experiment (the “photographing” of the sports selection and orientation activity) and of the formative psycho-pedagogic experiment (the introduction of the three progress factors: diagnose, sports counseling and the PSOsport v.1.0. application), we succeeded to optimize the sports selection and orientation process, creating a favourable context for keeping in the system a double number of children as compared with the period before the experiment and obtaining higher performances.

Conclusions regarding the role of diagnose

The SWOT analysis in the diagnosis offers the possibility to control and influence the direction and impact of the forces which may act during the progress of the activity within an education unit with sports program. Thus, a favourable context is ensured for the optimization of the entire activity, including that of sports selection and orientation.

The identification of the phenomena involved in the forecast and their objective analysis, can lead to showing special quantitative and qualitative aspects which, if correctly interpreted offer valuable information regarding the ways of optimizing the sports selection and orientation process.

Following the diagnose, the selection strategy has to take into consideration the nature of the conditions and the qualities of the sports children, and the Action plan regarding the sports selection and orientation (PASOS) has to take into consideration the different particularities of each sports discipline, so that the value of the performance becomes maximal.

The diagnosis has to be the synthetic expression of the analysis – diagnose, performed on the past period of an education unit with sports program. This has to start with the dynamic analysis of the unit condition and with the revelation of the causes which generated certain malfunctions.

The retrospective analysis is imposed by the need to know the development of the sports field from a quantitative and qualitative point of view in order to identify the trends.

The diagnosis has to perform a creative role, and at the same time a preventive role. This has to offer a critical interpretation of the information from the part, in order to know the starting levels in the forecast period.

Once the diagnosis objectives are established follows the design of a program by which the most effective ways for reaching the proposed objective have to be established.

In the period of the program elaboration will be taken into consideration all the directions which may lead to reaching the purpose, but especially the *biologic limits or the limits of other nature of the children subject to the evaluation*. The tasks of the program have to have a decisive character, materialized into the Action plan regarding the sports selection and orientation – PASOS.

In the end, PASOS has to be turned into a detailed document which will indicate precisely the most suitable methods and means for the optimization of the sports selection and orientation process.

Conclusions regarding sports counseling

The sports selection and orientation process can be optimized by *determining the degree of congruence between the skills profile of the child with the model of a sports discipline, following the objective evolution of the interests, aspirations and skills of the children, by a person with competences in sports counseling*.

The evaluation of the interests, aspirations and skills of the children made with the help of the information applications can lead to making the sports selection and orientation/reorientation activity more effective by considerably reducing the time necessary for collection and processing of data and information.

The sports counseling has to represent a well organized professional endeavour, structured, with specific means and techniques, being recommended first of all to the children wishing to practice a certain sport, but also to the children and tutors, the main purpose being that of helping the child to effectively use the physical and psycho-movement resources.

Conclusions regarding the use of information applications

The sports selection and orientation process can be optimized by the information of certain stages, by considerably reducing the time necessary for collection, storage and processing the data referring to the interests, aspirations and skills of the children.

The use of the information applications offers an immense potential, by the multiple facilities and advantages of technological order:

- the establishment and control of the optimum report between the values of the quantitative and qualitative indicators of the sports preparation process;
- performance of statistical and mathematical processing and the performance of forecasts with sports character;
- the collection, processing and management of information based on which decisions can be made regarding the strategy of the sports selection and orientation process;
- the efficiency of the organization and performance of the sports competitions;
- the quick visualization of the level of reaching the objectives programmed for a certain training sequence;
- accessing, in an intuitive manner, of a huge volume of data and information anytime anywhere (online/offline);
- considerable reduction of the time necessary for decision making.

In a pedagogical plan, the conclusions of our research underline the trend of the process movement towards the pedagogy of heuristic adjustment, in which the share of information applications will determine progress of conceptual and practical nature.

The optimization of the sports selection and orientation process at the level of the school sports club can be made by the scientific organization of the activity, the collaboration of the specialists, knowing the problems of sports counseling and the use of information applications.

The completion of the research allows us to formulate a few *practical-methodical suggestions* regarding the use of the applications based on the information and communications technology:

- The initiation of convergent actions for the teachers to become familiar with the problems of using information applications in the sports selection and orientation activity.

- The increase of the share of directing the sports selection and orientation process by means of the modern information means, establishing their limits and possibilities of use in the specific activity environment.

- The experimental approach of a project of creating a Sports National Data Base (BDNS) in a single network, with information resources specific for the directed sports selection and orientation activity (sports character information management national unit - UNGIS). The launching of this project can represent a qualitative leap forward, opening new perspectives in the problem of sports selection and orientation.

Summary of personal contributions

Theoretical contributions:

- Identification, analysis and establishment of the functional requirements and of the restrictions imposed to information applications used in the sports selection and orientation activity;
- Recovery of sports counseling in the sports selection and orientation activity;
- Diagnose and examination of action options which can contribute to the identification of the manners in which the efficiency of the sports selection and orientation process can be improved, at the level of an education unit with supplementary sports program;
- Identification of the role and recovery of diagnose in the sports selection and orientation process.
- The structure of the "Action Plan regarding the Sports Selection and Orientation – „PASOS”
- Principle scheme of the application "PSOsport v.1.0".
- Stages of the evaluation process of the skills profile in view of sports selection and orientation with the help of information instruments.

Practical contributions (implementations):

- The application "PSOsport v1.0"- information collection, management and generation program in view of optimising the sports selection and orientation process.
- Action Plan regarding the Sports Selection and Orientation – „PASOS”.
- Personal Electronic Form of the Sportsman – "FEPS".

Future research and possible developments:

- Integration of the results presented in an information application and its development by cooperation (development of the application "PSOsport v1.0" and of the Personal Electronic Form of the Sportsman.
- Elaboration of new evaluation techniques of the skills profile of the children, using information instruments.
- Extension of the facilities offered by the instruments created and developed in the thesis and in other vocational education units.
- Development of a Sports National Data Base (BDNS) in a single network, with specific information resources for the directed sports selection and orientation activity (sports character information management national unit - UNGIS).