

Method of Conducting a Pedagogical Experiment

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Abstract: The organization of a pedagogical experiment is associated with planning its implementation, which determines the sequence of all stages of work, as well as with the preparation of all conditions that ensure a full-fledged study. This includes preparing the appropriate environment, instruments, facilities, instructing assistants, planning observations, selecting experimental and control groups, assessing all the features of the experimental base, etc.

Key words: Experimental part, pedagogical experiment, scientific hypothesis, research objectives, experiment planning, process efficiency, methodological seminars.

Let us consider sequentially the main actions of a researcher who begins to develop a program for the experimental part of his work.

1. First of all, it is necessary to resolve the issue of the need for the experimental part of the study. It is known that a pedagogical experiment is understood as a scientifically conducted test of any organizational forms, means, methods and techniques of teaching, training and health-improving work.

2. Next, the issue of putting forward a scientific hypothesis is decided, which should be the basis of the experiment. A hypothesis is called scientific because, although it may contain an element of guesswork, intuitive belief in a possible positive effect, it must be based on certain scientific data and supported by theoretical arguments or conclusions. When organizing each specific experiment to test a narrower and more specific issue, naturally, in addition to the general hypothesis, private (working) hypotheses can be developed, in relation to which the assumptions of both the general hypothesis about the possible and expected positive impact, and those related to the characteristics of the specific experimentally tested aspect of the problem.

3. After specific working hypotheses have been formulated on the basis of a general hypothesis in connection with the specific problem under study, the researcher can think about the choice of types of experiment. Its solution depends on a number of points: the purpose and specific task of the study; stage of working on the problem; means used to conduct the experiment, etc.

4. Planning an experiment also includes the selection and assessment of the general conditions for its conduct, which primarily include:

• means for conducting a pedagogical experiment;

• location;

• contingent of subjects;

• teachers, trainers taking part in the experiment.

It is very important to get acquainted with the future object of the experiment, i.e., with the composition of the students, find out their attitude towards classes, training, the teacher (coach), and study the general picture of their physical and technical readiness. Visiting classes of potential subjects and conducting conversations with them can be very valuable in this regard. Such direct communication makes it possible to more correctly identify those students who may become the object of special observation during the experiment. No less important is a preliminary study of the characteristics of the pedagogical system of each teacher (trainer) who agreed to participate in the pedagogical experiment. Of course, for the success of the experiment, it is necessary that a teacher or trainer who is well versed in teaching and training methods and who knows how to achieve good discipline should take part in it.

5. Particular attention should be paid to the assessment and correct selection of equalized conditions. To evaluate the results of an experiment, the correct selection of subjects for completing the experimental and control groups plays an important role. These groups should be as identical as possible in their characteristics. Only in this case can it be said that the effectiveness of the educational and training process was achieved through experimental methods. Equalizing the characteristics of subjects by gender, age, physical fitness, professional affiliation, etc. called typological. It is also necessary to take into account the attitude of the subjects to the scientific work carried out by the researcher - forced involvement in participation in the experiment negates the success of the research. In an effort to equalize the characteristics of individuals selected to participate in the experiment, one cannot limit oneself to only analyzing personal data (gender, age, rank, etc.). Sometimes it is necessary to carry out special studies to establish the required characteristics, especially those on which the results will be compared. When recruiting experimental and control groups, any researcher should be guided by the formula: everything that can be equalized must be equalized.

The random sampling method is characterized by the greatest objectivity in the selection of subjects. According to the technique of implementation, this method has three options. The first option can be called the method of alphabetical lists. It consists in the fact that the names of all applicants are distributed strictly alphabetically and numbered in order. Persons whose surnames fall under odd numbers are included in the experimental group, those under even numbers are included in the control group, or vice versa.

The second option is the lottery method (drawing lots). In this case, the name of each applicant is entered on a closed card, all the cards are mixed and as many of them are selected as the number of people required for the experimental or control group. The subjects whose names appear on the selected cards are assigned to one group, the rest - to another.

The third option for selecting subjects is based on the use of special tables of random numbers.

If, in the conditions of a given organization, it is impossible to select two groups that are approximately equal in some leading indicators, it is customary to take the group with the worst indicators as an experiment. If positive results are obtained as a result of the experiment, these results will be more convincing.

6. Depending on the general goal and specific objectives of the experiment, the question of what experimental data the researcher should obtain during the experiment is decided. Despite

the huge variety of research tasks in different areas of studying the problem in different areas, in conducting the experiment itself in all cases there is much in common. This commonality lies in the fact that no matter what aspect of the new technique is tested, the experiment coincides with the educational and training process in which the coach and athletes or the teacher and students working according to one or another technique take part. Therefore, the object of observation during the educational and training process is always the students and the teacher (trainer). The methods used to study the object of study, in this case, can be divided into two groups:

- 1) methods used directly during the experiment;
- 2) methods used after completion of the experiment or any part of it.

The first group includes observation during classes using all possible means and private techniques to collect the necessary data. The second group of methods that check the results of the educational and training process consists of various kinds of control tests, tests, questionnaires, conversations, written reviews, etc.

7. Based on the above operations, you can begin to draw up an experiment program, which indicates the content and sequence of all actions (what, where, when and how will be carried out, observed, checked, compared and measured; what order will be established for measuring indicators and their registration ; what equipment, tools and other means will be used; who will do the work and what kind of work). It is important to establish criteria and systems of indicators, ways of their accumulation and processing, the procedure and forms of control. The main criteria for assessing the comparative effectiveness of the means, forms and methods of teaching and training used can be the qualitative indicators of the results of a pedagogical experiment, the volume of acquired skills and the time spent.

Thus, planning an experiment is a very complex and multi-stage process, which includes a number of mandatory actions by the experimenter, which include the following:

- defining the goals and objectives of the experiment, justifying its necessity;
- formulation of a scientific hypothesis;
- choice of experiment type;
- selection and assessment of general experimental conditions;
- assessment and selection of equalized data, their indicators in the methodology for collecting this data;
- drawing up a general program for the experiment, programs for conducting classes in experimental and control groups, as well as a program for conducting observations.

The second very important requirement when summing up is that the conclusions must be commensurate with the experimental base and the collected data, that is, they should not be “global”, going beyond the assigned tasks and areas of specific research.

However, the researcher can make some assumptions about the connection of the

conducted research with boundary problems and the need for further work to clarify their influence on the factors being studied. If the results of the experiment indicate that the question should be raised about the need to introduce certain tested means, methods and techniques for improving the educational and training process, students, completing their research, can outline some ways to implement this implementation. The implementation of research results can be understood as informing teachers, coaches, athletes, teachers and students about them through possible channels (student scientific conferences, department meetings, teacher conferences, methodological seminars for teachers and trainers, pedagogical press, etc.); creation of methodological recommendations and instructions; sets of special physical exercises; algorithmic type instructions for teaching any gymnastic element; training devices and technical means of education and training; databases for computers, training and monitoring programs using computers, etc.

So, when summing up the results of the pedagogical experiment, it is necessary to take into account the following:

- correlation of the conclusion and results with the general and specific hypothesis;
- a clear limitation of the area to which the findings can be extended;
- expressing assumptions and the possibility of their extension to some border areas and indicating the main directions for further research in this and related areas;
- assessment of the degree of reliability of conclusions depending on the purity of the experimental conditions;
- assessment of the role and place of the experiment in the system of other methods used in this study;
- practical proposals for implementing the results of the research into practice.

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