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International Scientific Conference**PSYCHOLOGICAL FACTORS OF DIFFICULTIES IN
EXPERIENCING LEARNING ACTIVITIES IN ADOLESCENTS**

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**Abstract**

The paper deals with difficulties associated with the experience of learning activities in the field of Physics. The data on the content of the studied phenomenon are given, the category of difficulties in experiencing educational activities is substantiated. On the basis of statistical analysis, psychological factors are identified. Teenagers were divided into two groups: with and without difficulties. A factor analysis was held in a group with difficulties. The factor model had 86% explanatory potential. It turned out that main psychological difficulties of experiencing the process of educational activity in studying Physics consist in the experience of emptiness as a feeling of meaninglessness, wasted time, within which there is no personal growth, which provokes a variety of negative experiences in adolescents. Deeper studies of this experience have shown that this is due to insufficient implementation of fundamental motivations, the experience of an "existential vacuum". Along with fixation on negative experiences, students were found to be reliably dependent on external assessments, in particular, marks in the subject "Physics". This kind of fixation is one of the psychological mechanisms that prevent self-development. The detection of these difficulties is the basis for the development of ways to overcome these difficulties. The identified factors: fixation on negative experiences and the expectation of external evaluation: allow us to develop and implement programs for both individual and group counseling of adolescents with difficulties experiencing the process of learning activities in the field of Physics, this will optimize the experience of the educational process by adolescents.

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Keywords: Schoolboy, teenager, experiencing difficulties, learning activities, factors

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1. Introduction

The personal development of a modern student determines the immediate future of the development of the country and society. In the current situation, in order to successfully experience crises and uncertainty about the future of the young generation, it is necessary to conduct a psychological study of promising problems, as well as to search for ways to achieve psychological well-being of schoolchildren in the modern world. This is noted by Ermakov and Panov (2020) and other scientists who write about the importance of psychological and pedagogical conditions and methods of changing the “anthropocentric position of a person in relation to ... the environment, as well as to the nature of the person himself” (p. 121).

The study of physics as a general education subject is of great importance in shaping the worldview and scientific outlook of the future school graduate, affects a wide range of important competencies and puts physics in a special place among other educational areas.

System-activity approach of the FSES secondary school involves the "construction of training process taking into account the individual psycho-pedagogical features of students" and the development of interdisciplinary skills, including mainframe: regulatory, cognitive, communicative learning activities and the ability to use them in practice (order of the Ministry of education and science of the Russian Federation, 2015). Dyakova (2019) notes that when teaching physics, the teacher "seeks to encompass all kinds of students' activities with his leadership, to "lead" them in their cognition," which, as a result, entails learned helplessness, and later - problems with independent choice. The scientist points out that this fact remains unnoticed and is supported by school norms (Dyakova, 2019). The educational process in the field of studying physics is associated with the unique educational opportunities for the development of metacognitive resources of the student's personality. However, in our opinion, in educational practice, the influence of the Federal State Educational Standard, as the basis of the educational process, is largely leveled out (Chernyavskaya & Dudko, 2020).

2. Problem Statement

Physics is on the list of disciplines that most often cause difficulties for schoolchildren. When studying physics, schoolchildren often have psychological difficulties and barriers that prevent understanding and assimilation of the material. Integration of the abstract side of the discipline and specific types of objective activity in the framework of laboratory work allows you to master the complex physical phenomena of the objective world. The main task of the study was to find out what psychological factors depend on and what are the difficulties of experiencing educational activity in the study of physics.

3. Research Questions

In the study, Dobrodiy (2019) notes that problems (mistakes) in the study of physics by schoolchildren are made by students for reasons associated with psychological and cognitive difficulties: speech, cognitive and others. The researcher indicates as the main ones - mistakes in tasks using schematic drawings, students experience difficulties in performing these tasks due to the influence of stress, and as a

solution to problems (with reference to L. S. Vygotsky) offers a description of their actions in words (written or oral), as well as a generalization and the name of the experience (Dobrodiy, 2019).

At the same time, we have not found a description of the difficulties of experiencing the process of educational activity when studying a physics course in a psychological context. Psychological difficulties that arise within the framework of school education can hinder the professional and personal self-realization of the younger generation, which requires special study. Comparing students to each other can be an obstacle to a favourable experience of the educational process (Garanyan & Shchukin, 2014). Difficulties in students manifest themselves at different stages of learning, but they play a special role at the initial stage of studying physics, when students form attitudes and motives for studying this subject.

Especially difficult is the experience of psychological difficulties in adolescence, the period of "storm and onslaught". Before implementing measures of psych prophylaxis and counselling adolescents about the resolution of psychological difficulties, it is necessary to find out what the main problems of studying physics are (Dixon-Gordon et al., 2011; Rusting, 1998).

The complexity of the problem, according to Spiridonov et al. (2019), is determined by its structure, content, components of the life situation, the need and lack of opportunity to change it.

The problem of the difficulty of experiencing the study of physics has all these properties, therefore it is complex. As such, it is represented mainly by problems of negative emotional attitudes. As elements of the representation of complex psychological problems, thoughts, emotions, behaviour and attitudes are noted, which fully corresponds to the problem posed by us, related to clarifying the factors of experiencing difficulties in the study of physics by 9th grade students (Spiridonov et al., 2019).

The understanding of the term "experience" in modern psychological science is considered in different aspects, which makes it difficult to concretize it. So, Vygotsky (2016), studying the features of child psychology, interprets experience as a special and key unit of consciousness, uniting the environment in its relation to the subject (what is experienced by a child), and the subject (what the child himself brings into this experience, his personality traits). Experiencing is a dynamic environment that determines behaviour.

Vasilyuk (1984) develops a completely different view of the subject of experience. In the mainstream of his theory, experience is considered in the context of the activity approach and is an internal work (activity) through which a person manages to cope with difficult life situations, to endure them, to withstand, to overcome painful feelings or a state. We are talking about some active, effective internal process that really transforms the psychological situation, about experience-activity.

In foreign psychological science, one of the most interesting and popular approaches to the consideration of experience is the theory of optimal experience (flow) by Csikszentmihalyi (2015). Optimal experience and optimal activity are understood as independent forms of activity and experience, the purpose of which is themselves, that is, serving as a justification for themselves, performed not for the sake of possible reward, but for their own sake. Optimal experience is also called autolytic (Chiksentmihay, 2015).

Leontiev et al. (2015) and co-authors developed and operationalized a three-dimensional combinatorial model of experiences in activity in order to clarify the criteria for the optimality of flow experience and correlate it with other types of experiences. According to this model, if the structure of the experience does not reflect all three structural elements (pleasure, interest and effort), a person within the

described activity feels helpless, weak, which is described by the experience of emptiness. In addition to identifying three mandatory components in the structure of optimal experience, the combinatorial model allows us to observe various combinations of these components and describes them (Leontiev et al., 2015, Leontiev, 2015).

Based on a theoretical analysis of the scientific works of Vasilyuk (1984), Chiksentmihay (2015), Lengle (2009, 2017, 2019), Leontiev et al. (2015), Leontiev (2015), Karpov (2004), Znakov et al. (2012), the category of difficulty of experiencing the process of educational activity in the field of studying physics was substantiated, which we defined as a subjectively biased reflection of the adolescent's attitude to the educational process, which consists in internal discomfort (illiteracy), non-optimal experience of educational activity.

4. Purpose of the Study

Identification of psychological factors that determine the difficulties of experiencing the process of educational activity in the field of physics, as an adolescent complex problem of education.

5. Research Methods

The study was conducted on a sample of grade 7 students aged 13-14 years. The sample consisted of 40 people, including 13 boys and 27 girls.

Psychodiagnostic techniques were used: content analysis of essays for a qualitative and quantitative analysis of semantic categories associated with experiencing difficulties in the study of physics, a technique for diagnosing experiences in activity (DEA A. Leontiev). The test of existential motivations (TEM A. Lengle), the method of self-assessment of metacognitive knowledge and metacognitive activity (M. M. Kashapov) for the diagnosis of metacognitive abilities as a mechanism mediating the difficulties of experiencing the process of educational activity in the field of physics study, statistical methods were also used: nonparametric Mann-Whitney U-test; factor analysis: principal component method, Kaiser criterion (Varimax rotation criterion with Kaiser normalization), criterion of "stony scree" by Kettel..

6. Findings

In order to clarify the attitude of students to the subject of physics, respondents were asked to write an essay about their attitude to this subject. The results of the content analysis of the essays of each of the respondents were analyzed and summarized, semantic units and types of connotations (positive and negative) were identified, which allowed us to identify a group of students with difficulties in experiencing educational activities in the academic subject "Physics".

By means of data analysis and statistical verification by the Mann-Whitney U-test, the sample was divided into empirical groups: group A - respondents with difficulties in experiencing physics lessons - 15 people; group B - respondents without identified difficulties in experiencing physics lessons - 25 people.

In order to highlight the psychological characteristics of the difficulties of experiencing the process of educational activity in the field of studying physics and identifying factors (prerequisites) in each group,

we applied the method of factor analysis, namely the method of principal components (Varimax criterion, rotation with Kaiser normalization).

According to the Kaiser criterion, the number of factors must be equal to the number of components whose eigenvalues exceed 1. There were five such components in group A and three in group B, so five factors and three factors should have been identified, respectively. To confirm the optimal number of factors, Kettell's "rocky scree" method was used. According to the Kettell method, the number of factors is determined by the inflection point on the eigenvalue graph, after which a sharp decline is replaced by a relatively flat curve. The graph of eigenvalues of the factor model of group A is shown in Figure 1, Group B in Figure 2.

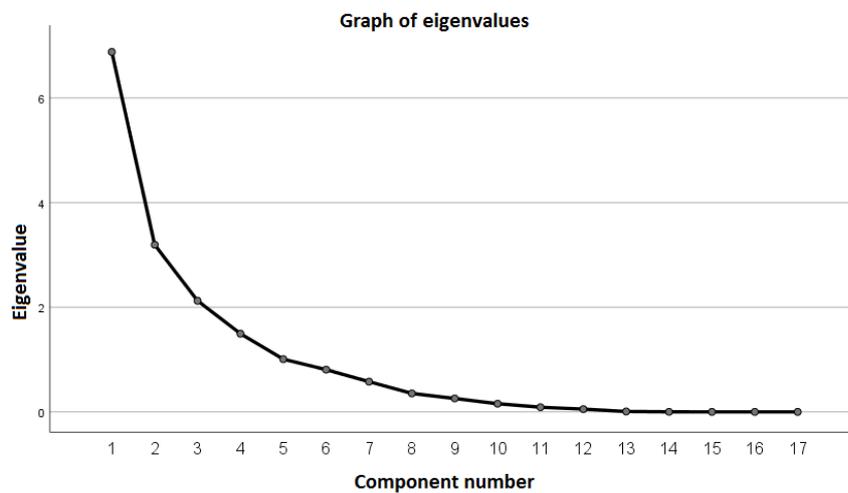


Figure 1. Graph of eigenvalues of the factor model of Group A

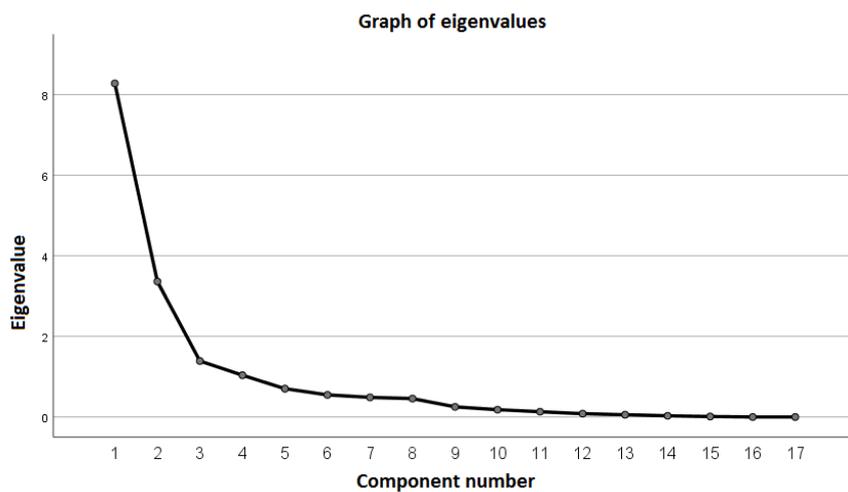


Figure 2. Graph of eigenvalues of the factor model of Group B

By the principal component method, the explained aggregate variances were compiled, showing what explanatory potential the factor models of groups A and B have. The explained cumulative variance also reflects the factor load of each factor. The factor model of group A has 86% of the explanatory potential the factor model of group B has 77% of the explanatory potential. As a result, rotated component matrices were compiled, showing what correlation each variable has. Variables with a statistical significance above 0.5 were selected. The content of factors of both groups was presented below (Table 1).

Table 1. Content of factors of groups A (with difficulties) and B (without difficulties)

| Factor | Group A | Group B |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Fundamental trust, general indicator of existential motivations, fundamental value, effort (negative pole), self-worth, emptiness (negative pole), meaning of life | General indicator of existential motivations, self-worth, fundamental value, meaning of life, fundamental trust, effort (negative pole) |
| 2 | Metacognition, choice of main goals, metacognitive activity, metacognitive knowledge, academic performance in physics, time management | Metacognition, metacognitive activity, information acquisition, time management, choice of main goals, metacognitive knowledge, concentration |
| 3 | Information acquisition, pleasure, metacognitive knowledge, academic performance in physics | Emptiness (negative pole), effort (negative pole), pleasure, meaning |
| 4 | Concentration, time management, self-worth, meaning of life | |
| 5 | Meaning, pleasure, emptiness (negative pole) | |

Analyzing and comparing the factors in terms of the content of the components of group A and group B, you can see that in both groups there are factors similar in content. Using a meaningful analysis of the factor models of both groups, it was found that the factor model of group A has a larger distribution of factors than the factor model of group B, which indicates a more complex system of relationships between the experience of the process of educational activity in the field of physics, which combine fundamental motivations, metacognitive parameters and academic performance in physics. Students with difficulties in experiencing the process of educational activity in the field of physics reveal a sense of meaninglessness, “wasted” time, within which personal growth is not felt, which provokes negative experiences. This feature is associated with insufficient implementation of fundamental motivations, unfulfilled life, the experience of an "existential vacuum". Along with fixation on negative experiences associated with difficulties, students are characterized by dependence on external assessments. "External" is more important for them than "internal" - probably the predominance of external type of motivation. Despite the fact that students enjoy their own growth and self-development, any of their activities are associated with the expectation of external evaluation. This kind of fixation is one of the psychological mechanisms that prevent self-development.

The revealed differences in factors associated with the appearance of psychological difficulties in the study of physics and the absence of these difficulties demonstrate that the second category of students has a more pronounced ability to feel life as valuable, to take an internal position in relation to existing facts and conditions, to focus on the feeling of “right to be yourself”, finding the meaning and value of

each moment, and as a result, improving the subjective experience of the quality of life, including in the educational process.

7. Conclusion

Based on the identified features of a group of students with difficulties experiencing the process of learning activities in the field of physics, in particular—the relationship of feelings of emptiness (helplessness, meaninglessness) with the listed categories: fixing emotions on negative experiences, directing metacognitive resources to the "outer circle", fixing attention on external assessments, - it can be assumed that the inclusion of these facts is a resource of optimization of experience of the process of educational activity in the study of physics and can lead to the realization of their fixation on external evaluations and negative feelings, and allow them to focus on their existing resources, which will assist the formation of positive emotions, feelings, values of life, acceptance of self and realization of self-worth. Further work with adolescents in this area should be associated with the formation of contexts of identified prerequisites that appeal to filling the void, finding the meaning and value of each moment in learning, awareness of the possibilities of metacognitive resources, self-knowledge, developing an internal position in relation to the facts, reducing the desire to satisfy someone's needs, finding the opportunity to depend on yourself, distancing and the ability to find pleasure beyond all estimates.

The experience of adolescents in the process of educational activity in the field of studying physics can be optimized through the use of specially designed programs, which can be based on the facts found in the study. The study of psychological difficulties within the framework of our work can become a direction of research in the services of practical psychology of general education institutions. The work was carried out on the basis of the approaches of existential psychology, existential analysis, metacognitive psychology.

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