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PSYCHOLOGICAL STABILITY OF FUTURE SPECIALISTS IN NUCLEAR INDUSTRY AND ITS ESSENTIAL-CONTENT CHARACTERISTICS

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Abstract

The research reveals essential characteristics of psychological stability regarding future specialists in the nuclear industry. Psychological stability is very important for these graduates' professional activity as they are subject to high professional and personal requirements in conditions of increased responsibility for ensuring radiation safety and reliability of complex systems. The paper outlines the essence and content of psychological stability of nuclear industry specialists, considers existing concepts in psychological and pedagogical science and in specifics of professional activity in this industry. The authors describe the concept of psychological stability of nuclear industry specialists as an integral property of a person, including stress resistance to negative psycho-emotional influences; management of modern technical equipment, which requires high personal responsibility in making adequate decisions in rapidly changing production conditions, having certain personal qualities as well as cognitive potential to ensure operating safety, etc. This definition makes it possible to fully reveal the essence and content of the following structural and functional components: motivational-value, informational–cognitive, professional-activity, regulatory-behavioral, reflexive-personal. The paper also briefly reveals the essence and content of some selected components; thereby the psychological stability of nuclear industry specialists in the process of professional activity comes to the fore and represents a system-forming factor in the system of professional personal qualities.

Keywords: Nuclear industry, psychological stability, approaches, component, pedagogical system

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1. Introduction

In modern socio-cultural and economic-industrial conditions, future specialists of the nuclear industry are most susceptible to the influence of various negative factors on their psychological stability, since modern high-tech production in the nuclear industry requires constant in-creased attention to the production process and strenuous mental and volitional efforts to organise and manage this process. This leads to premature physical and mental fatigue. Thus, there is a psycho-emotional burnout of specialists in the nuclear industry, first of all, of those working in responsible areas for servicing the most complex nuclear power plants. As a result, their performance decreases and they develop negative symptoms (e.g. memory impairment, inattention, decreased attention switching, nervousness, insomnia, etc.), which might have an extremely adverse effect on psychological stability of those specialists who deal with nuclear reactors and other complex energy systems and installations in the nuclear power industry. In these conditions, the issues related to psychological stability of specialists in the nuclear industry become particularly relevant.

2. Problem Statement

The researchers aim to formulate the content of the concept of psychological stability of future specialists of the nuclear industry, considering the specifics of their professional activity, as well as to identify and theoretically substantiate its structural and functional components.

3. Research Questions

In the research the authors firstly reveal the essence and content of psychological stability of these specialists, characterize its properties and specifics. Then they point out what factors significantly affect the functioning of the system and they investigate how its structural components are interdependent and interact.

To do this, it is necessary to develop psychological stability in specialists working in the field of the nuclear industry. Therefore, the problem exists even at the stage of these specialists' university training. In this regard, at the stage of higher education, a whole complex of difficult problems is identified. All that is directly or indirectly related to the problem of psychological stability development. This is the problem of students' adaptation to the constantly changing conditions of the socio-psychological environment at the university (Aleksina, 1988; Aseev, 1967; Kushmanova, 2006; Parhaeva & Ilmushkin, 2018; Parhaeva et al., 2018). Moreover, in the conditions of the pandemic, many problems are extremely acute for the effective organization and conduct of the entire complex of distance education of students, including psychological, pedagogical, educational aspects directly related to the psychological stability of students. Often, failing to cope with distance learning, students encounter difficult or unpleasant situations and do not find a decent way out, which, of course, affects their psychological stability, hindering the normal process of students' adaptation to new conditions of the educational process organization. At the same time, the pace of educational activity accelerates, and psychological stability of students in other areas of their life decreases either. Ultimately, psychosomatic changes of the body are revealed, which can subsequently lead to mental

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disorders and physical deviations in the state of health and create prerequisites for more serious diseases, such as hypertension, diabetes mellitus, depression of various origins, mental personality changes, etc. All that is a sign of psychological instability.

4. Purpose of the Study

The authors aim to find the solution of the problem described above on the basis of theoretical and methodological foundations.

5. Research Methods

Theoretical and methodological foundations of the research include system, activity, axiological, integrative, interdisciplinary and personal approaches as well as psychological and pedagogical scientific literature analysis.

Among the selected theoretical and methodological approaches, the leading one is the systematic approach in psychological and pedagogical research. The first fundamental foundations of the systemic principles were built by A. A. Bogdanov. His theory was further developed by von Bertalanfi (1973). The systemic approach makes it difficult to identify structural components of the system, to study their interactions, to reveal structural and functional connections of the objects of the system, to predict its development, and, if necessary, to correct the behaviour of the system in the right direction. This approach was also adopted for the pedagogical research of Blauberg (1980, 1997), Ilmushkin (2005), Korolev (1970), Prangishvili (1990).

The systemic approach is widely implemented in the modeling of pedagogical systems and their theoretical justification from the position of the systemic approach. This approach was then developed in the following papers (Arkhangelskiy, 1994; Belyaeva, 1987; Blauberg, 1980; Bezrukova, 2004; Ilmushkin, 2001, 2005; Slastenin, 1998).

The systematic approach in this research provides a scientific justification of the essence and content of psychological stability of specialists in the nuclear industry.

Serikov (1999) highly appreciated the importance of the systematic approach in pedagogical research, stressing that it was a universal method of scientific cognition of the objective world. Bespalko (1995), Kuzmina (1980), Tatur (2004) and other scientists also studied pedagogical systems.

The formation of psychological stability of specialists in the nuclear industry cannot occur outside their activities; therefore, the activity approach occupies a key place in revealing the essence of this phenomenon. The activity approach is based on the conceptual theoretical positions of Vygotsky (1960), Leontiev (1975), Talyzina (1986), Elkonin (2013), and takes into account the laws of personality development.

The interdisciplinary approach to the study of this phenomenon is aimed at the effective application of cognitive knowledge from different fields of sciences, which enriches and fills its essence and content with a new meaning.

It is important to note that such methodological approaches as axiological, integrative and personal also occupy an essential place in the study. In particular, the personal approach is associated with the

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formation of personal qualities necessary for psychological stability, socialization and successful professional activity in the nuclear industry.

6. Findings

This study reveals the essence and content of psychological stability off future specialists in the field of the nuclear industry, and indicates its structural and functional components based on leading theoretical and methodological approaches. The results of the research made it possible to design an effective structural and functional model of the formation of the psychological phenomenon introduced in the paper and to develop productive diagnostic tools for measuring the level of its formation.

7. Conclusion

Based on the analysis of the existing definitions, the authors introduce the following definition of the concept of psychological stability of specialists in the nuclear industry. The concept of psychological stability of specialists in the nuclear industry is a systematic education of an individual, integrating stress resistance to various negative psycho-emotional influences, the ability to manage complex modern technical devices, systems, equipment, reactor units in conditions of radiation danger, requiring high personal responsibility, close attention, making adequate decisions in rapidly changing production conditions. This also implies the ability to foresee the conditions of unfavourable development of complex systems, having cognitive potential to ensure the safety of their work, the presence of certain personal qualities (in particular, endurance, rapid decision-making, a sense of high personal responsibility, constant professional development, good physical the state of health, high operational memory, logical thinking, the ability of divergent thinking, efficiency, etc.). That includes the conscious manifestation of the interests and needs of personal achievement, as well as the motivational and value attitude to maintaining the proper level of psycho-emotional state and physical health in the process of active work in the nuclear industry.

Based on the content of the concept of psychological stability and the designated methodological approaches, the main structural and functional components of the phenomenon under study are identified as motivational-value, informational–cognitive, professional-activity, regulatory-behavioral, reflexive-personal.

The motivational component is determined by the need for motives for the active formation of psychological stability. The information and cognitive component, in its turn, is determined by knowledge, skills and abilities in the field of psychological stability. At the same time, the reflexive-personal approach includes fundamental personal qualities necessary to ensure psychological stability.

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