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**TÍTULO:** Interdependencia del bienestar psicológico y el rendimiento académico de los estudiantes de ingeniería.

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**RESUMEN:** En este trabajo, el bienestar psicológico se considera un factor que afecta el desempeño de los estudiantes de ingeniería. El estudio se realizó entrevistando y evaluando a los estudiantes según un modelo desarrollado por Ryff C.D. Según los resultados del estudio, se descubrió que la gran mayoría de los estudiantes tienen un nivel bastante alto de bienestar psicológico, incluso en términos de un indicador como la autoaceptación. La mayoría de los estudiantes también se caracterizan por una incapacidad para hacer frente a los asuntos cotidianos, un sentimiento de imposibilidad de mejorar sus condiciones de vida. En el estudio se aborda una dependencia de la regresión de la influencia de factores individuales del bienestar psicológico en el rendimiento académico de estudiantes de ingeniería.

**PALABRAS CLAVES:** bienestar psicológico, estudiantes de ingeniería, rendimiento académico, factores de bienestar psicológico.

**TITLE:** Interdependence of psychological well-being and academic performance of engineering students.

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**ABSTRACT:** In this paper, psychological well-being is considered as a factor affecting the performance of engineering students. The study was conducted by interviewing and evaluating students according to a model developed by Ryff C.D. According to the results of the study, it was found that the vast majority of students have a fairly high level of psychological well-being, including in terms of such an indicator as self-acceptance. Most students are also characterized by an inability to cope with everyday affairs, a feeling of impossibility to improve their living conditions. In the study, a regression dependence of the influence of individual factors of psychological well-being on the academic performance of engineering students was constructed.

**KEY WORDS:** psychological well-being, engineering students, academic performance, factors of psychological well-being.

**INTRODUCTION.**

At this stage of the development of society, the concept of psychological well-being is actively studied, since it is essential for understanding human nature, the phenomenon of happiness, attitudes toward life and human values. Psychological well-being is a rather subjective concept,

which reflects the joint coordinated action of mental processes, functions, as well as a sense of integrity and internal balance.

The relevance of the problem is also determined by the request from society, which is due to the desire of each person to be happy, the need to improve the quality of life.

This problem is particularly relevant for young people since modern student youth is the so-called generation Z - that is, the first fully digital generation. Their values are still in the process of formation, they have not yet completed the puberty period of their development, while the peculiarity of this generation is that they are better versed in gadgets than in human relationships. With the advent of the Internet, a fundamental transformation took place in the field of information exchange and communication, which, of course, could not but affect the ways of achieving psychological well-being. Young people are connected among themselves through the Internet, social networks, YouTube, using mobile phones, SMS and therefore psychologists note a high level of attraction to individualism, self-confidence and focus on the success (Mohr & Mohr, 2017; Seemiller & Grace, 2017).

Psychological well-being was considered from different angles - from physical and mental health to a component of economic relations. In modern studies, psychological well-being is considered as the fullness of a person's self-realization in specific life conditions and circumstances, as the possibility of finding a balance between the requirements of a social environment and the development of one's personality (Ryff, 1989).

In this paper, psychological well-being is considered as a factor affecting the academic performance of engineering students. In general, psychological well-being is a subjective category, but the approach proposed in the article makes it possible to objectively evaluate its impact on academic performance. The objectivity of the academic performance category is to evaluate the results of the

educational activity of a person by others and to recognize these results as significant, where measurements are carried out based on fixing acquired knowledge and skills.

## **DEVELOPMENT.**

### **Literature review.**

Modern studies of psychological well-being are based on the research work of C. Ryff (1989), where a list of factors contributing to psychological well-being, satisfaction, and happiness of a person is defined: self-acceptance, personal growth, goal in life, comprehension of the world (environmental management), autonomy, positive relationships with others (Dodge et al., 2012). In Ryff C.D., Keyes C.L. (1995), experimental confirmation of the previously created model is described, and it is also proposed to combine factors of self-acceptance and environmental management.

A generalized review of studies of psychological well-being was carried out by Ryan R.M., Deci E. L. (2001). The authors distinguish two areas of research in this area:

- A hedonic approach focusing on the categories of happiness and the definition of well-being in terms of achieving satisfaction and preventing pain;
- A eudaimonic approach, focusing on meaning and self-realization and determining well-being in terms of the level of how a person performs his functions.

In this regard, approaches to the study of some issues in the field of psychological well-being differ. Namely, how the cultural and social features in the sense of psychological well-being inherent to people of a certain culture, as well as a certain social environment, and universal, general characteristics of human culture are correlated. Besides, relevant is the question of the relationship of the sensation of the psychological well-being of an individual to the psychological well-being of the whole community as a whole.

In other works, on well-being, various factors affecting psychological well-being are studied and it is established that:

- People who are well integrated into society, benefit more from the emergence of new social identities and suffer more from their loss, in contrast to those who are isolated from society (Thoits, 1983).
- Insecurity in the world of work reduces psychological well-being and job satisfaction, and also increases psychosomatic complaints and psychophysical stress (De Witte, 1999).
- The appearance of children and the new social role of the parent can have negative consequences for the psychological well-being of adults (McLanahan & Adams, 1987).
- General psychological well-being is highest in people, at least in the USA, whose age is slightly above average (Thoits, 1983).
- The meaningfulness of life and psychological well-being are directly related, since the level of psychological well-being is directly related to the subjective feeling of the ability to realize significant values. In individuals with high psychological well-being, the structure of actual psychological well-being is approaching the structure of ideal psychological well-being; in individuals with low psychological well-being, there are disagreements between these constructs (Fesenko, 2005).
- A high level of subjective well-being determines the choice of effective strategies for solving life problems and helps to preserve the mental health of the individual (Puchkova, 2003).

Considering another aspect of the problem, namely the study of academic performance, it is necessary to note that academic performance has been the subject of many psychological studies. Thus, M. Richardson, C. Abraham, R. Bond (2012) are having analyzed more than 400 articles from English-language psychological journals for the period from 1997 to 2010, identified 50 conceptually distinct factors of academic performance at the university. Among them, there were

traditional objective performance indicators (average grade of a school certificate, tests of academic ability and intelligence tests), as well as 42 variables that did not belong to the intellectual sphere.

Their authors were divided into five groups:

- 1) Personality traits.
- 2) Motivational factors.
- 3) Strategies for self-regulation of learning.
- 4) Training approaches.
- 5) Contextual psychosocial factors.

The results of the analysis showed that among personality traits that closely correlate with academic performance, conscientiousness (0.19), cognitive need (0.19) and a tendency to postpone tasks at the last moment (-0.22).

In the group of motivational factors, the self-assessment of their academic abilities (0.31), the presence of a goal to get a high mark (0.35) and the self-assessment of ability to fulfill (0.59) are closely related to the average assessment.

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The authors' attempt to construct multidimensional regression equations for predicting the average grade yielded the following results: indicators of the regulation of educational efforts, test anxiety, self-assessment of academic abilities, and the goal of obtaining a high score together helped explain up to 20% of the variance of the average score (the average school score and academic ability tests provided 22 % dispersion). However, in the statistical control of intellectual characteristics, the regulation of efforts, self-esteem, and the presence of a goal increased the share of the explained variance of estimates by only 6%.

The monograph (Akhryamkina & Chaus, 2012) examined the psychological well-being of participants in the educational process. The book reveals the concepts of psychological well-being of various groups of students, the notion of subjective perception of psychological well-being is highlighted within the contextual approach.

Particular attention is paid to students who have problems with adaptation in the educational environment: gifted, hyperactive students, as well as teenagers. The study highlights such a thing as the subjective perception of psychological well-being. When diagnosing the subjective perception of psychological well-being, an important point is the identification of the personal context of the perception of psychological well-being. One and the same event has different meanings for an individual depending on his personal experience and attitudes. Thus, stressful relationships or, conversely, supportive relationships will be interpreted from the perspective of the psychological context. An experimental study showed that there are significant differences in the perception of psychological well-being by students, their parents, and teachers.

Foreign researchers have also examined the relationship between psychological well-being and academic performance. In general, it has been established for developing countries that a higher level of well-being is associated with the high academic performance (Nonis & Hudson, 2006; Berger et al., 2011; Cadime et al., 2016). For developed countries, studies did not show a connection between academic performance and well-being (Topham & Moller, 2010; Ruppel et al., 2015), since the low academic performance was often not associated with a low level of well-being (Bücker et al., 2018).

Thus, summarizing the literary review, it is noted that this issue is highly relevant. In general, the topic of psychological well-being has been widely studied for various groups of the population (of different ages, sexes, living in different countries and having a significantly different income). Moreover, the results of certain works often contradict each other. There are practically no works

that study the characteristics of the psychological well-being of engineering students. All this indicates that studies of psychological well-being are still far from complete.

The purpose of this article is to study the interdependence of psychological well-being and academic performance of engineering students.

### **Research methods.**

Research methods used during the implementation of the study were observation, self-observation, questionnaires, structured interviews, qualitative and quantitative methods of analysis (correlation analysis).

At the first stage of the study, 83 students of the South Ural State University, Kazan National Research Technological University, Penza State University of Architecture and Construction, and Russian G.V. Plekhanov Economic University was asked to independently evaluate her physical and psychological health on a “high-medium-low level” scale.

At the second stage of the study, the psychological well-being of students was evaluated according to the scale proposed in Ryff C.D.

At the third stage, a generalized assessment of the results and identification of trends was carried out.

At the fourth stage, a linear multivariate regression model of the influence of various groups of factors was constructed according to the Ryff C.D. model on the academic performance of engineering students. The following groups of factors were considered: positive relationships with others, degree of autonomy, environmental management, personal growth, goals in life, self-perception. Academic performance was assessed generally (as an average mark) in subjects of an engineering profile.

**Research results.**

The psychological health and well-being of students depend on the influence of some factors that determine either a favorable condition or a health disorder. R.A. Berezovskaya (2010) determined the main list of factors leading to the maladaptation of students during vocational training, and then to emotional exhaustion, which negatively affects their psychological well-being. Factors are divided into the following groups:

1) Factors associated with the educational process: a large academic load; a sharp change in the content and volume of the material; the emergence of new (compared to school) forms and methods of teaching (lectures, seminars, colloquiums, tests, etc.); complex language of scientific and lecture material; lack of independent work skills; the need for accelerated processing of information in conditions of time pressure; variety or monotony; uninteresting textbooks; unwillingness to learn or awareness of the wrong choice of profession; learning at night, insufficiently formed personality traits such as willingness to learn, the ability to learn independently, managing individual characteristics of cognitive activity; uncertainty in their knowledge; worries about possible misunderstandings with the teacher; impaired memory and thinking; poor concentration vague requirements for assessing student competencies.

2) Biological and physiological factors: inability to properly organize one's daily routine; lack of good nutrition; the use of substances that excite the central nervous system; poor sleep, decreased performance and fatigue.

3) Emotional factors: a feeling of helplessness and inability to solve problems; irritability, anger, resentment, fear, bouts of aggression and affective states; bad mood, longing, anxiety, depression, loss of confidence, decreased self-esteem; negative forecast of arising situations.

4) Social factors: poor quality of living conditions; inability to properly use limited financial opportunities; problems living together with other students; conflict in the study group; temporary isolation from direct communication with friends; lack of control over events; problems in personal life; habit of smoking, drinking alcohol; violation of social contacts, communication problems.

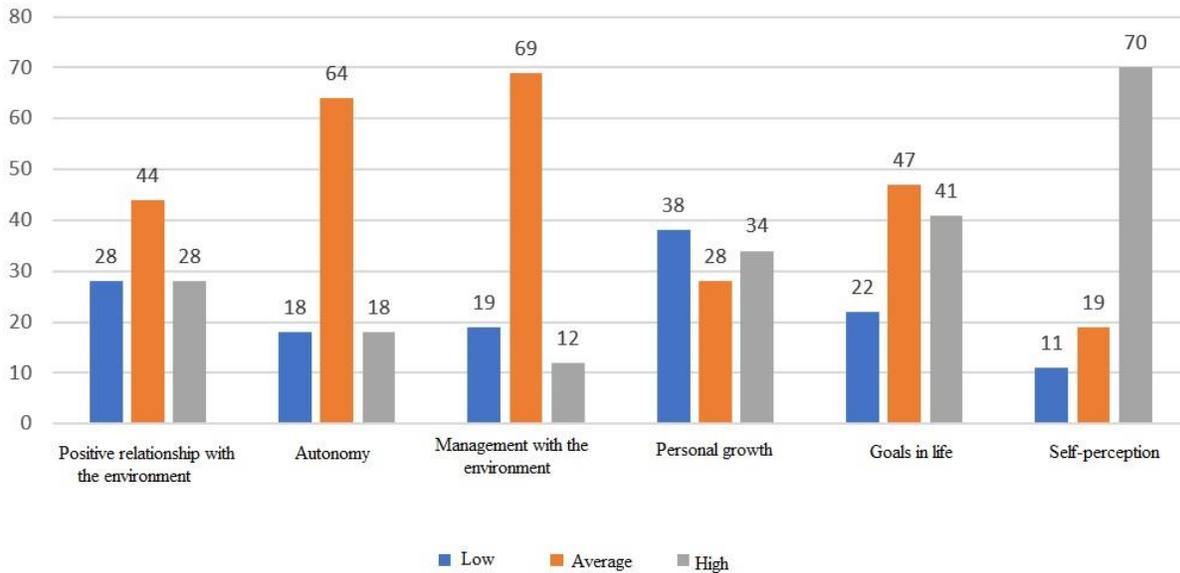
After surveying students on the subject of their physical and psychological health (on a scale: good-medium-low), it was founded that the majority of respondent students (42%) rate their physical health at an average level, another third (38%) - low and 20% high. Regarding their mental health, its students evaluate it as follows: 70% of the students studied rate their own mental health at a high level, another 19% at an average and 11% at a low.

Summarized results of a study of the psychological well-being of students on the Ryff C.D. scale are presented in Table 1.

**Table 1. Summarized results of a study of the psychological well-being of students on the scale proposed by Ryff C.D., %.**

Indicator level	Positive relationship with the environment	Autonomy	Management with the environment	Personal growth	Goals in life	Self-perception
Low	28	18	19	38	22	11
Average	44	64	69	28	47	19
High	28	18	12	34	41	70

**Figure 1. Generalized results of a study of the psychological well-being of students on the scale proposed by Ryff C.D., %.**



It was found, that most of the students surveyed are characterized by a positive relationship with others. This indicates that they have close, pleasant, trusting relationships with others, about the desire to take care of other people, the ability to empathy, love, and intimacy, the ability to find compromises in interaction. At an average level, this indicator is found in more than a third of students. A low level of positive in relations with others reveals a fifth of respondents.

A high level of autonomy is inherent in 18% of students. They are characterized by independence, the ability to withstand social pressure in their thoughts and actions, as well as the ability to regulate their behavior and evaluate themselves based on their standards. 2/3 of the students surveyed have an average level of autonomy, and only a small part is low. Respondents with low autonomy are concerned about other people's expectations and ratings. For a small percentage of students surveyed, there is a feeling of confidence and competence in managing everyday affairs, the ability to effectively use various life circumstances, the ability to choose and create conditions that satisfy personal needs and values.

High indicators of personal growth, which are characteristic of more than a third of students, can be an indicator of the process of their continuous self-development. Average grades on this scale are characteristic of about a third of the students surveyed, and low grades are characteristic of a slightly larger part of the respondents.

For more than 1/3 of the students surveyed, the presence of goals and a sense of meaningfulness of life are inherent. The average indicators on this scale are characteristic of the majority of students surveyed, and the low - 22%, that is, there is a blur of their goals in life.

A high level of self-acceptance is inherent in most of the respondents, and the average is only for a small part of students. These respondents are characterized by supporting a positive attitude towards themselves, recognition and acceptance of their diversity, including both good and bad personal qualities, as well as a positive assessment of their past. A low level of self-acceptance is characteristic of only 1/10 of the respondents.

3. Based on the results of the study, it can be concluded that the vast majority of student respondents have a fairly high level of psychological well-being, especially for such an indicator as self-acceptance. It is also worth noting that for such an indicator of psychological well-being as environmental management, only 12% of students have a high level. This indicates that most students are characterized by an inability to cope with everyday affairs, a feeling of inability to help or improve their living conditions, as well as a feeling of powerlessness in managing the world around them.

4. Considering the influence of psychological well-being factors on academic performance, a linear multivariate regression model was constructed based on survey data and academic performance:

$$\text{Acad. Performance} = 2.4762 + 0.2736 * \text{goals in life} + 0.0901 * \text{degree of autonomy.} \quad (1).$$

The resulting dependence as variables includes indicators such as the presence of certain goals in life and the degree of autonomy. At the same time, the influence of other variables is insignificant; therefore, they are not included in the model. In general, it can be concluded that the importance of students' motivation and goal setting, as well as the role of students' strong-willed qualities as the main factors in achieving academic performance. The coefficient of determination of the constructed model was 0.85, which indicates its high adequacy.

### **Discussion.**

Psychological well-being is a necessary condition for the formation of the student's personality and an integral part of the formation of motivation for self-realization.

As an integral personality category, psychological well-being functions in dynamics and therefore is a motivational parameter of the personality. The degree of severity of psychological well-being depends on the realism, structuredness, integrity (consistency of the past, present, and future) of the personality relationship system and its life perspective, including goals, plans, values, and aspirations.

The psychological well-being of the personality on the example of engineering students is associated with value-semantic orientations (life goals, the process of life, the effectiveness of life) and the vitality of the personality.

The personal potential of psychological well-being lies in the realization of internal resources from realizing one's potential and achieving life prospects - reserves for full realization in the present and the possibility of developing one's vital forces, labor and spiritual abilities in the future.

It is established that the main factors affecting the academic performance of engineering students are motivational and volitional.

The academic success of a particular student is affected by a significant number of factors: interest in the subject, perception of its usefulness, general desire to fulfill the tasks, self-confidence, and self-esteem, as well as patience and perseverance, and of course, not all students are motivated by the same values, needs, desires.

Some will be motivated by the approval of others, others by overcoming problems. Perhaps a high positive motivation and a desire to achieve their goals in the profession can be a compensatory factor in the case of insufficient abilities or insufficient stock of knowledge. It is assumed that the attitude to the profession, the motives for its choice are of great importance (and in some cases, exceptional) to improve academic performance. The development of professional motivation allows not only to increase the effectiveness of the educational activities of students but also helps to build professional competence.

## **CONCLUSIONS.**

As part of the study of goals, it can be determined that the basis of integral indicators of the degree of orientation of the personality are the main components of positive functioning. Psychological well-being is subjectively expressed in feelings of happiness, satisfaction with oneself and one's life.

The various conclusions of researchers of psychological well-being in its essence and components are due primarily to the fact that it is evaluated by the person himself from the standpoint of his values and goals. Since the latter are always individual, the universal well-being structure for all cannot be. In this case, it is advisable to study the factors that influence the subjective feeling of satisfaction (the existential experience of a person concerning his own life).

The interviewed students of generation Z can be described as having trusting relationships with others who understand that human relations are built on mutual concessions; they are quite independent and independent, able to independently regulate their behavior; able to create

conditions and circumstances characteristic of satisfying personal needs and achieving goals; strive for personal growth; aware of the goals of their future. At the same time, a significant part of respondents is not confident in their ability to achieve goals.

In general, it can be concluded that the importance of motivation and goal setting in the system of psychological well-being of students, as well as the role of volitional qualities of students as the main factors in achieving high academic achievement.

It is assumed that students with a high level of academic achievement are dominated by an interest in the chosen profession, there is a high motivation, a characteristic attitude towards quality and accuracy, the desire to complete educational tasks as best as possible, the tendency to defend one's opinion, the ability to cooperate and willingness to interact.

It is possible to assume that the chosen life goals are the most desired in the educational activity. However, it is believed that ignoring other types of orientation would not be correct for such an assessment.

#### **BIBLIOGRAPHIC REFERENCES.**

1. Akhryamkina, T. A., & Chaus, I. N. (2012). A956 Psychological well-being of students in the educational environment: monograph. Samara: SF SBEI HPE MGPU, pp. 104.
2. Berezovskaya, R. A. (2010). The concept of psychology of personality relations and its methodological significance for the development of health psychology. Actual problems of the theory of practical psychology of relations: materials vseros. scientific-practical Conf. Yekaterinburg, Ural state ped un-t; scientific ed. S. A. Minyurov, S. V. Dukhnovsky. – Ekaterinburg, pp. 36–39.
3. Berger, C., Alcalay, L., Torretti, A., & Milicic, N. (2011). Socio-emotional well-being and academic achievement: evidence from a multilevel approach. *Psicol. Reflex. Crit*, 24(2), 344-351.

4. Brown, K.W., & Ryan, R.M. (2003). The Benefits of Being Present: Mindfulness and Its Role in Psychological Well-Being. *Journal of Personality and Social Psychology*. American Psychological Association, Inc., 84(4), 822–848.
5. Bücken, S., Nuraydin, S., Simonsmeier, B. A., Schneider, M., & Luhmann, M. (2018). Subjective well-being and academic achievement: A meta-analysis. *Journal of Research in Personality*, 74, 83-94.
6. Cadime, I., Pinto, A. M., Lima, S., Rego, S., Pereira, J., & Ribeiro, I. (2016). Well-being and academic achievement in secondary school pupils: The unique effects of burnout and engagement. *Journal of Adolescence*, 53, 169–179.
7. De Witte, H. (1999). Job Insecurity and Psychological Well-being: Review of the Literature and Exploration of Some Unresolved Issues. *European Journal of Work and Organizational Psychology*, 8(2), 155-177.
8. Dodge, R., Daly, A., Huyton, J., & Sanders, L. (2012). The challenge of defining wellbeing. *International Journal of Wellbeing*, 2 (3), 222–235.
9. Fesenko, P.P. (2005). The meaningfulness of life and the psychological well-being of an individual: author. dis. for a job. degrees of cand. psychol. Sciences. Moscow, PP. 22.
10. McLanahan, S., & Adams, J. (1987). Parenthood and Psychological Well-Being. *Annual Review of Sociology*, 13, 237-257.
11. Mohr, K.A. J., & Mohr, E.S. (2017). Understanding Generation Z Students to Promote a Contemporary Learning Environment. *Journal on Empowering Teaching Excellence*, 1(1).
12. Nonis, S.A., & Hudson G.I. (2006). Academic performance of college students: Influence of time spent studying and working. *Journal of Education for Business*, 81(3), 151–159.
13. Puchkova, G.L. (2003). Subjective well-being as a factor in self-actualization of personality: abstract. dis. for a job. degrees of cand. psychol. Sciences. Khabarovsk, pp. 21.

14. Richardson, M., Abraham, C., & Bond, R. (2012). Psychological correlates of university students' academic performance: a systematic review and meta-analysis. *Psychological Bulletin*, 138(2), 353–387.
15. Ruppel, F., Liersch, S., & Walter, U. (2015). The influence of psychological well-being on academic success. *Journal of Public Health.*, 23. 15-24.
16. Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual review of psychology*, 52(1), 141-166.
17. Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*, 57, 1069-1081.
18. Ryff, C.D., & Keyes C.L. (1995). The structure of psychological well-being revisited. *J Pers Soc Psychol.*, 69(4), 719-727.
19. Seemiller, C., & Grace, M. (2017). Generation Z: Educating and Engaging the Next Generation of Students. *About Campus*, 22(3), 21–26.
20. Thoits, P.A. (1983). Social Isolation Hypothesis. *American Sociological Review*, 48(2), 174-187.
21. Topham, P., & Moller, N. (2010). New students' psychological well-being and its relation to first year academic performance in a UK university. *Counselling and Psychotherapy Research*, 11(3), 196-203.

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