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## Senior school children's representations about engineering activity

*The article analyses the problems of the professional education and engineering activity. The results of the empirical four –staged research dedicated to the development of the representations of senior school children representations about engineering education are presented.*

**Keywords:** professional education, professional choice, engineering activity.

The Russian society hasn't been only exposed to social and economic transformations. The significant changes have happened in the content orientations of the educational strategies. The changes have lately been made in the preparation of the specialists in the field of the humanistic, natural and technical sciences. In the connection with the appearing economic growth there is a need in the preparation of the competent specialists of the technical and engineering professions. This vital need has caused the reorientation of the future university entrants from humanities into the technical and engineering specialties. Taking into consideration all the above mentioned, one of the pressing problems of psychological science and practice is the development of the adequate representations of the senior school children about the engineering education, able to play the role of the basis of their professional choice.

The problem of the professional education forms one of the most studied layers in psychological and pedagogical science. Their studies are connected with the different aspects of the man's human orientation and are regarded in the context of the professional self-determination (Golovakha E.I., Klimov E.A., Prizhnikov N.C., Povarenkov U.P., Khomenko N.V., Chistikova S.N. and etc), professional growth (Borissova E.M., Kou-drivtsev T.V., Lednev V.S. and others) and development (Asmolov A.G., Dontsov A.I., Kossov B.B., Kotova I.B., Feldshtein D.I., Shianov E.N. and others). At present we have distinguished the different determinants of the professional choice – objective and subjective (Klimov E.A., Prizhnikov N.S., Stoliarenko L.D.). The particular role is played by the professional orientation which represents the system of the emotional and value relations, making the person choose one of the professional activities (Mitina L.M., Brendakova I.V., Vachkov I.V. and etc.).

The studies of the engineering activity as the object of the professional preferences is a little investigated field of psychological sciences. The process of the professional training and professional suitability of the engineer are more studied (Tatoushkina M.K., Rostounov A.T.), structure of the engineer's technical intelligence (Zakharova V.P.), socio-psychological problems of the engineering activity (Chougounova E.S., Chiker V.A., Yadov V.A., Pougach E.I.), questions of the professional training of the engineer – teacher (Zeer E.F.), psychological resources of the engineering training (Gabdreev R.V.), particularities of the development of the self-attitude among



engineers and technical workers (Panteleev S.R.), dynamics of the professional characteristics of the engineer in the process of acquiring the professional skills (Vodnikov V.A.) are being reviewed. Some researchers have studied the professionally important skills for engineers, among them – K.K. Platonov, V.D. Schadrikov, V.A. Yadov, K.U. Baicharov, T.A. Maiboroda and other researchers. What kinds of the qualities of the young people encourage the professional choice in the favor of the engineering activity, are still out off the field of the close attention of the psychological and pedagogical science.

The perspective exists in finding correlations between the pointed out preferences and representations of the senior schoolchildren about the engineering education. The works in this direction became possible after handling the problem of the representations in the research of the national and foreign scientists (Agueev V.S., Bodalev A.A., Petrenko V.F., Popova I.M., Smirnov S.D., Shikhirev P.N., Durkgeim E., Moskovichi S. and others).

The practical need and insufficient theoretical background made this problem urgent, and we used it as a basis of our research.

**The aim of the study:** to find out the conditions of the development of the representations about engineering education among senior school children.

The research was carried out at the basis of secondary schools Rostov-on-Don and several towns of Rostov region (Shakhty, Zernograd, Salsk). The sampling was made from the senior schoolchildren – pupils of 10 and 11 forms of the secondary schools in total 210 people. The average age of the senior schoolchildren, respondents included into the sampling, is 16,8.

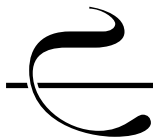
**The main hypothesis of the study:** representations about the professional engineering education, reflecting the particularities of the senior school children's positioning in the engineering, they play the role of the psychological conditions of their readiness to the corresponding professional choice.

While carrying out our study we used the following methods: «Differential and diagnostic questionnaire» by E.A. Klimova, «Questionnaire of the professional preferences» in G. Golland modification, «Value orientations» by M. Rokich.

The study was carried out from 2006 up to 2010 and included the following stages:

1. Preparation stage (2006–2007) suggests working out in details of the subject field of the research, defining the aims and tasks of the research, establishing the theoretical bases of the research work, creating the methodic aspects of the empirical research.

2. The recital stage of the empirical part of the study (2007–2008) included the formation of the experimental sampling, finding out the main fields of senior school children's representations about the engineering profession, establishing the facts about their development, creating the structure of the representations about the qualities, necessary for the successful engineering activity, and the level of the senior school children's qualities.



3. The formative stage of the empirical part of the study (2008–2009) suggests the elaboration and evaluation of the program of the senior schoolchildren's development of the representations about engineering education.

4. The final stage of the research (2009–2010) consisted of analysis and integration of the results of the theoretical and empirical parts of the research, their interpretation and its presentation as a thesis.

In this research we have received the results, which let us make the following conclusions.

1. Representations of the senior schoolchildren about engineering education is a complex integration formed from the subjective reflection of the particularities of the engineering activity and the assessment of the possibilities of the self-realization while doing it.

2. Representations of the senior schoolchildren about engineering education include some context groups, combining the knowledge about the engineering activity and contents of the professional preparation, the subjective position with reference to the engineering activity and the possibility of the self-realization at the personal level with the help of the engineering education.

The first two context groups form a cognitive compound, and two others –value and context compound of the representations about the engineering education.

3. Development of the senior schoolchildren's representations about the engineering education is influenced by a number of the subjective and objective factors. To the objective factors of the development of the representations of the senior schoolchildren about the engineering profession are related: parents or close relatives having the engineering education; a high school which allows receiving an engineering education in the locality. The subjective factors of the representations development about the engineering education are: confidence in having the necessary abilities, required by the engineering activity; orientation towards profession (according to E.A. Klimov); professional representations (according to G. Golland); value orientations (according to M. Rokich).

4. The representations of the senior schoolchildren about the engineering education have an impact upon their readiness to choose this education. The biggest influence is made by the value and context component of the representations about the engineering education.

5. Choice of senior schoolchildren of the engineering education suggests the creation of professional and personal qualities, necessary for successful career in the engineering activity. These qualities at the subjective level include the three groups of the business, emotional, will and adaptive qualities.

6. Development of the senior schoolchildren's representations about the engineering education happens successfully if they combine the practice of enlarging the knowledge in the corresponding sphere of the professional activity and development of the senior schoolchildren confidence in their capabilities according to the profession requirements.



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