

PROFESSIONAL SUCCESSION AS A CONDITION FOR THE REPRODUCTION OF ENGINEERING ELITE

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Abstract

Professional succession again begins to play a significant role in the training of engineers and researchers. If the previous century was a period of creating a system of mass education, today the situation has changed. The new generation was more educated than the previous one, and the education system is experiencing difficulties. Currently, the family as the oldest educational institution capable of transmitting an "informal knowledge" becomes important. Nonetheless the family capital becomes the main factor in achieving great career results as professionals. But there is one sense of formal inheritance of professions within families. The article analyzes the results of the investigation of the processes of professional continuity engineering profession as a social condition of reproduction of technical elite industrial region. Research findings based on data from formal interviews with masters STEM-training areas, as well as materials used expert survey of young (under 35 years) engineers three largest industrial corporations in the industrial region.

Key words: inter-corporate marketing, HR security, personnel segmentation, internal competitiveness.

JEL Code: Human capital; Skills; Occupational choice; Labor productivity (J24), Wage Level and Structure; Wage Differentials by Skill, Training, Occupation (J31)

Introduction

The longitudinal study revealed the results of interviews with applicants, who choose for themselves exclusively technical specialties, the main factor of their choice was the continuity of family traditions. Content analysis of documents led after, showed the conclusion that is three quarters of entrants and students in technical specialties, reproduce the same professional orientation as their fathers.

1. The aim of the study.

Professional Engineer status implies not only the presence of a full-fledged modern education, practical engineering experience, but also the presence of the medium of professional communication. In the role of the latter can be a family, professional societies, the business environment. Family forms a system of values, attitudes, largely determines the professional choice. The next level is a professional reproduction of the university. Engineering thinking is influenced by educational programs and teachers. The final stage of formation of professional identity has been in practice. No accident that the European countries accredited to the title of engineer requires a high school diploma along with the availability of professional engineering experience at least seven years. High level requirements for the competence of the modern engineer is difficult to achieve in formal education, even after a master degree. Interaction of generations in a professional environment (professional communication, knowledge transfer, participation in projects) in the family and in the corporation is a significant informal channel of sustainable reproduction of the engineering staff. The influence of parents, family, most clearly seen in the processes of social and vocational choices of students. How to assess the degree of family influence on the professional socialization STEM- masters programs, as persons who already have a basic technical education and make a choice for further development in the field of engineering? How to evaluate the role of the family, "significant other" young engineers already free of youthful extremism and claim to independence? Effect of parental family representatives on the technical intelligentsia of other generations, likely to be present, but in these cases, other more important facts of their social biography.

The aim of the authors - to identify the importance and extent of family succession in engineering professions. The study was conducted in the framework of the project to identify the characteristics of the formation of modern technical elite in the modernization of the industrial economy of the region.

2. Theoretical backgrounds and methodology.

Polish researchers Boni and Szafraniec [2, 8-29] believe that today is much weaker intergenerational solidarity, ie compatibility ratings, aspirations and desires in life. In comparison with the 1990s criticism of intergenerational relations in Poland was sparse and most of the young people (and even then it was almost 20% of respondents). Today, only 35% of young people do not have criticisms of their parents. The researchers note that formed a new model of entry of young people in self-employment life.

Cherednychenko GA [11, 2-5] proposes to analyze the way of life of the person to use the concepts of educational and professional trajectory. The traditional model of the transition involves a sequence of shift training activities for labor, that is, a situation where an individual after receiving a general or vocational education into the labor market "once and for all", and received a permanent full-time employment, and up to this point had no experience in labor and professional activities, more and more rooted in the past. The same results had get Schreuders, P. D., & Mannon, S. E. [9, 33-351], Ribeiro, M. A. [8, 19-27], Kreher, S [7, 183-205].

Bourdieu & Passeron [3, 14-27] have shown that despite widespread claims of equality of opportunity, the elites have adapted new strategies to ensure its continuity from generation to generation. Educational system, in spite of the latest reforms and the increased level of education as a whole, not only destroyed the class and cultural inequalities, but rather strengthened it. Parents with prestigious occupations are able to use their social and economic resources in order to give their children a good education, which, in turn, helps the latter to take a prestigious jobs. Bourdieu's emphasis on the cultural capital. He argues that parents create a cultural environment that promotes the development of a variety of skills that are rewarded in the educational system.

According, Shkaratan and Yastrebova [12, 5-27], Ochkin [10, 28-41] in the present situation it is the family is the most sane and working channel of intergenerational continuity (including professional). Choosing a profession, a young man determines your future social status and lifestyle, which can be traditional or non-traditional contrary to his family. Occupational status of parents, relatives, the scope of their professional communication, reflected in the family and the home, creates the conditions for a professional identity formation. Professional continuity between parents and children is implemented, according to the researchers, in three main forms: the socio-cultural, social and professional. You can talk about mainly socio-cultural form of professional continuity in the family, when formed a certain attitude to the profession, work in general, and not just to a particular specialty.

Ural sociologists ([1, 10-15p] revealed the results of interviews with applicants, to choose for themselves exclusively technical specialties, the factor of continuity and continuation of family traditions. Content analysis of documents (personal affairs students - engineers) led to the conclusion that three quarters of entrants and students in technical specialties, reproduce the same professional orientation as their fathers.

Research group in June 2013 was conducted expert survey of engineering professionals (N = 240), three of the largest industrial companies in the region, including 40%. the proportion of young engineers (under 35 years). Research findings based on data from formal interviews with the Masters (N = 78) of the technical areas of training. In the questionnaires of different

groups of respondents included a number of questions about the motives for choosing the engineering profession, the presence of "significant others" engineers questions about the status of the engineering profession, about the professional plans and career expectations.

3. Results of the study

Leading factor in the choice of technical specialty acts terminal value of vocational educational training, its universality, for it forms the skills and personal qualities that contribute to career development in any of the social prestige today work areas (primarily management and business). Social prestige of engineering education in the evaluation of learning, determined to provide opportunities for social mobility and movement in certain sectors of activity, depending on the Estimating the value of the "influence of family traditions, the parents' choice of high school, future profession should distinguish between" influence "and" pressure "of the parents. In our study, this difference could be carried out only by indirect indicators, through a set of motives for choosing a specialty. Turned out to be highly informative comparative analysis of motives for choosing a profession students of the third year of study, master's and young engineers.

The gap in the evaluation of the degree of influence of family traditions for the initial selection of a career path of the students and masters three times. If the presence of an even greater gap in the estimates of young engineers and students can be explained by age range, thirty-release ("young adults") from unnecessary claims for independence, in the case of masters break at the age of 3-4 years. Those persons who have chosen as their career path further development of labor-intensive engineering master's degree programs, celebrate awareness of their choice.

Table 1. Motivations for young people to come to engineering and technical specialties (in%)

| Motives for the choice of profession | STEM students | masters STEM | Engineers and 35 years old |
|---|---------------|--------------|----------------------------|
| Interest in the profession | 47 | 56 | 36 |
| Attracted the prestige and authority of the university | 30 | 46 | 30 |
| Attracted the prospect of finding a good job after college | 32 | 36 | 34 |
| The desire to get a degree (no matter where and how) | 17 | 51 | 67 |
| Attracted an active student life, "in company with friends" | 20 | 34 | 26 |
| Considered (a) the ability of the best in the industry | 12 | 21 | 16 |
| Influenced by family tradition, parents | 13 | 37 | 60 |
| Influenced by studies in a specialized classroom, college, lyceum | 12 | 23 | 45 |
| Did not want to go into the army | 9 | 44 | 35 |
| It was easier to do | 9 | 9 | 22 |
| I wanted to secure a stable material prosperity in the future | 27 | 24 | 29 |

Source: Formation of engineering elite industrial region: the sociological analysis [1, p.15]

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Guards only the content of family influence, very similar to the pressure, and not a voluntary choice. So, when choosing a career is almost not taken into account the applicant's ability in this area, but strongly expressed "the desire to get a degree" as "a sign of education" (Jean Baudrillard). 40% of respondents masters and engineers was an example of engineering activities in the near environment (have relatives engineering profession), one of the respondents was trained in a specialized class, college, you have the option of an engineering degree was quite conscious. At a certain part of the respondents choice could be random (in company with friends) or "parents are like this."

Having the ability to engineering activities not included in the list of most designated motifs. Students selecting this motif indicated twice as likely than the masters. This motif have every fifth student-master. It is no coincidence, since the respondents were represented by masters enrolled in such programs as time consuming electronic systems, information security, nano materials, analytical chemistry, etc. A quarter of respondents engineers as one of the motives for choosing a technical specialty indicated relatively low barriers ("it is easier to do). Chose this answer is only one out of ten students and masters. The "input" into the profession in the future engineers and researchers formed a few romantic attitude to the engineering profession, which is clearly evident in comparison with estimates prestige of the profession of engineer masters and young practical engineers. (Table 2)

**Table 2. The evaluation of the engineering profession's prestige
(% of those who chose each option)**

| evaluation parameters | masters | engineers | difference |
|-----------------------|---------|-----------|------------|
| high | 26 | 5 | +21 |
| above average | 31 | 10 | +21 |
| average | 39 | 60 | -21 |
| below average | 4 | 17 | -13 |
| low | 0 | 8 | -8 |
| Total: | 100 | 100 | |

Source: Formation of engineering elite industrial region: the sociological analysis. [1, p.21]

Whether and to what extent the family environment professional engineer or technical teachers on the formation of professional values, such as the assessment of the status of the

profession, dedication, commitment to the profession, to identify with it? If the presence of a professional environment and affects the professional continuity, then this relationship is more subtle, it is manifested in the amount of cultural capital engineer, his dedication to the profession, etc. In response to a question about the most important qualities of a modern elite Corps of Engineers, "hereditary" engineers more often isolated answers about the necessity of non-standard engineering thinking about the need for broad general engineering, cultural and moral outlook, highly qualified in the field of applied sciences.

A more appropriate measure of professional commitment was to assess the level of potential yield interviewed engineers and their potential electoral different areas of employment. A direct question about whether there is a desire to get away from this place of employment, 40% of all young engineers (from "engineering" and "non-engineering" families) responded positively. Young engineers, emphasizing the social significance of profession, to show potential opportunities, the need for continuous training, however, does not believe that the profession of engineer today provides adequate remuneration.

Among the graduates of the 2000s (generation 30-35 years) the largest percentage (39%) have parents engineers quarter - close relatives (grandparents). Of these young engineers 9% are at the top, a quarter are the leaders of the middle and lower-level managers. Graduates of 2010 (35%), "went to the Engineers" more under the influence of grandparents. Their parents (45-50 years) who have graduated from universities in the 90s were not advised to choose this profession. The vast majority of these graduates work in professional positions. From cohort to cohort decreases the confident that the profession of engineer - their vocation, increasing the percentage of uncertain and negative responses.

Conclusion

Intergenerational continuity among engineers realized today primarily as a self reproduction graduates. Meanwhile, the trend of professional and socio-cultural continuity is clearly waning. Presence of a medium of professional communication in the family, in a situation of serious complaints about the field of formal education may not be basic, but no less important area of formation of the ethical foundations of engineering activities, without which it is difficult to try to form an engineering elite. Along with the important area of family formation of the modern engineer is a developed business environment for professional communication (its formal and informal channels).

Investigation of the processes of professional inheritance (professional engineering dynasties) as social conditions of reproduction of technical elite is, in our opinion, a promising

direction for further work. Especially because the dynamics and factors of continuity of generations in science, medicine, education increasingly becoming the subject of research interest to sociologists and psychologists.

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