IRSR INTERNATIONAL REVIEW of SOCIAL RESEARCH
Volume 4, Issue 2, June 2014, 163-173 International Review of Social Research

The Relationship between Higher Education and the Workforce in Romanian Socialist Industry Case-study of the '23 August' Factory

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Abstract: This article presents the mechanisms used to integrate higher education graduates in socialist economic units. The case-study referring to the '23 August' factory in Bucharest mainly relies on the files of Securitate, and those of the economic section of the Central Committee of the Romanian Communist Party. It also outlines the practical difficulties faced by various groups of higher education graduates – engineers, economic staff, human sciences graduates – as well as their efficiency within the communist industrial framework. The study combines the description and analysis of numerical allocation, the responsibilities and the results of the activities carried out by higher education graduates.

Keywords: *higher education, engineers, factory relationships, employees, Securitate.*

The totalitarian regime in post-war Romania erected the entire socio-economic scaffolding on the foundation of the planning principle. Human resources were essential in the new economic policy, and the generalized control of the state facilitated the pursuit of a major goal: manpower planning. This study shows, at macro-level, the policies used to insert technical higher education graduates in industry, and, at micro-level, the integration of engineers in industrial units and their relationship with other professionals (foremen, workers), Case-study: the '23 August' factory.

The policy whereby industry absorbed technical higher education graduates was applied according to the economic development measures implemented by communist authorities, and emphasized an intellectual category with a notable role in the socio-economic changes of post-war Romania.

Among the graduates, engineers represented a major interest both for the state and for a large amount of the

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population. Their work is predominantly intellectual and practical; moreover, the directions of action focus on research, planning and production. The work of this category/corporation is conditioned by management plans, the field of action, the main goals and access to commodity markets, which means increased production capacities, the diversification of products, cost effectiveness, the innovating process and automation carried out by specialists, engineers in this particular case. The acquisition of highly skilled workforce is essential to economic growth, regardless of the political regime; therefore, industrial development is closely related to the professionalization of the workforce.

The education system provides indispensable knowledge for practical activities. In this case, the organization of education had to comply with the new economic indications. Measures of organization / reorganization of new forms of education, starting with 1948, affected the following forms: seven year secondary schools, ten year secondary schools, the setup of two year special schools, technical secondary schools and evening school courses, vocational apprenticeship, technical schools for foremen; the academic year 1953-1954 was decisive for the transformation of two year special schools into labor faculties (Someşan, 2004: 271-272).

A new classification system was applied during Ceausescu's regime, among which: prior professionalization, professionalization itself and post-professionalization; the initial stage included kindergarten, primary and secondary education. Effective professionalization (high school, vocational, higher education, qualification) offered alternatives conditioned by the degree of accessibility and intellectual abilities, as follows:

A. after graduating compulsory education (tenth grade) → graduates were employed in production → a) training courses b) stage II (evening courses); c) master schools
B. after compulsory education (tenth grade) → 11^{th} – 12^{th} grades →
- 2.1. manufacturing employment: a) qualification, b) school for foremen, and c) evening courses;
- 2.2. university
C. after vocational schools → graduates were employed in production a) foremen schools; b) high schools stage II; c) qualification.

The post-professionalization stage involved professional training through re-qualification activities, refresher courses, multiple qualifications, and the acquisition of management knowledge (Deniforescu, 1982: 110).

Intensive industrialization, substantial human and material resources, and, in this context, specific learning skills of the future workforce were required. Technical higher education was among the key structures in the training of specialists (especially, engineers). Engineers were defined in *Lexiconul tehnic român* as 'highly skilled technicians, holders of an academic degree [...] who carry out technical work design, organization and planning processes, the management or operation of the activity of industrial enterprises [...]. In other words, the engineer is first a technician [...],an integrated intellectual material

production, and he does not have to come before a factory machine like a beginner before the microscope' (Cernea, 1971: 228-229).

Graduates were absorbed as soon as possible by industrial units in continuous growth and expansion; however, the role of young professionals in production and projection did not play a significant role. The latest industrial workers were not satisfied with the assigned tasks, and this is how an engineer described the situation: 'there are no conditions to do engineering adequately. We are wasting time doing useless activities, such as information, reports, meetings, check sheets. They are not given topics for future research' (Cernea, 1971: 279). However, although there were many problems of employment and job assignments, as the growing industrial sector increased constantly, so did the number of students in polytechnic institutes.

In the academic year 1957/1958, there were 41 higher education institutions with 125 faculties, as compared to 16 institutions with 41 faculties in 1938-1939; the number of graduates in 1956 (about 17,000 attended part-time courses) exceeded 78,000 as compared to the 28,000 recorded in 1939 (ANIC, CC-PCR-Propagandă şi Agitaţie, 7/1957, 3).

New statistics data are found in the archival documents of the late 1950s; in this case, in the HCM no. 1572 of November 15, 1958, the Central Statistics Office registered the professional working class. The engineering positions in industry, classified according to activities performed and the level of education were as Table 1 shows.

The data show a significant

Table 1. *Engineering jobs*

	Engineering jobs with training			
	Total	Higher education	Medium	Elementary
Republican industry	24.508	65.7	15.6	18.7
Management services	3.311	60.7	17.5	21.8
Technical services	9.421	66.3	16.9	16.8
Supply and delivery services	204	43.6	22.1	34.3
Administrative services	192	19.3	21.3	59.4
Productive directly services	7.373	71.7	12.6	15.7
Auxiliary sections and services	4.007	60.7	15.6	23.7

Source: ANIC, CC-PCR-Economică, 40/1959, 2.

percentage of posts of engineers occupied by workers without academic or high school training in the following branches: ferrous metallurgy, building materials, forestry, wood processing, textiles and leather, fur and footwear. The number of engineers in automotive industry and metal processing was 9,385 out of which 63.8 per cent were higher education graduates (ANIC, CC-PCR-Economică, 40/1959, 2v).

There was a constant attempt to bridge the gap between highly skilled employers as compared to other

professional groups, as shown in the statistics compiled at the end of the academic year 1962/1963 (see Table 2).

Table 2. *Comparison between the number of technical higher education and technical and foremen graduates*

Branch	Number of higher education graduates	Number of technical school graduates	Number of foremen school graduates	TOTAL of technical and foremen graduates	Ratio between engineers and technical and foremen graduates
Mine and oil	3,321	687	2,737	3,424	1.03
Energy	4,123	1,789	434	2,223	0.54
Metallurgy and machinery building	7,550	3,678	4,105	7,783	1.04
Chemistry	2,662	5,153	1,418	4,571	1.70
Wood industry	51	282	1,224	1,506	3.30
Light industry	630	419	1,782	2,201	3.50
Food	792	473	675	1,148	1.46
Construction and raw material	5,663	2,036	1,865	3,901	0.70
Transport and telecommunication	1,836	3,898	2,092	5,990	3.30
TOTAL	27,028	16,415	16,332	32,747	1.20

Source: ANIC, CC-PCR-Propagandă şi Agitaţie, 5/1965, 49.

The number of graduates increased since 1956 to 2,520 (about nine point seven per cent), while in metallurgy and machine building there was a 26 per cent increase 26 per cent (7,550 as compared to 5,988); overall, focus on metalworking and engineering was paramount in the political and economic context of that period.

The comparison between engineers, technicians and foremen can be carried out after the distribution of 1,000 workers, a report which was drafted in 1972 (see Table 3).

On average, 21 engineers, 32.5 technicians and 18.1 foremen did not comply with the pace of industrialization, so that it was necessary to supplement the allocated places for technical higher education.

The number of technicians and foremen corresponding to an engineer was two point four (total industry), two point seventy-four (metallurgy) and two point zero eight (building machine industry). Moreover, the number of technical higher education graduates was lower as compared to other socialist countries, but given the industrial development of the country, the solution to increase the number of students was advisable (72 students/10,000 inhabitants in Romania as compared to 178 in

Table 3. *Weight of engineers to 1,000 workers*

	Weight of engineers (per cent)	Number of engineers/1,000 workers
Total Industry	1.8	21
Energy	3.8	47
Metallurgy	2.7	26
Building machinery	3.4	40
Light industry	1.4	15
Food	2.6	29

Source: Hutira (1983): 146-147.

Bulgaria, 194 in Czechoslovakia, 117 in Democratic German Republic, 243 in Poland, 177 in Hungary and 179 in the USSR) (Enache, 1975: 110).

The increasing number of students, especially in technical areas, reduced the gap with other countries, but created a surplus of specialists in certain manufacturing sectors.

As the official data show, during 1960-1988, technical higher education was completed by graduates of technical higher education that meant 326,966 students [231,605 engineers (mechanical specialization: 80,679, technology and textile chemistry: 6,028, electric: 38,437, power: 10,485, chemistry: 22,833, technology and food chemistry and fishing technique: 4,446, metallurgy: 10,112, coal mining: 5,020, oil: 3,651, geology: 4,436, architecture and systematization: 4,341, construction: 32,359, geodesy: 1,419, forest: 7,359) and 95,361 sub-engineers] (ANIC, CC-PCR-Propagandă şi Agitaţie, 57/1989, 3). The weight of technical education increased from 17 per cent (6,800 as compared to 40,941 in the academic year 1944/1945) to 33 per cent (43,160 in the academic year 1965/1966), and grew to 68.8 per cent (113,185 as against 164,507 in the academic year 1989/1990) (ANIC, CC-PCR-Propagandă şi Agitaţie, 33/1987, 5; ASR, 1990: 164-165).

The increase in enrollment followed the indications of relevant ministries, while new labor force distribution was conducted by a government committee (see the provisions of Decree no. 54/1975). Some graduates were employed in research, projection, engineering and higher education according to the criteria set by the Ministry of Education and the National Council for Science and Technology (ANIC, CC-PCR-Propagandă şi Agitaţie, 26/1985, 2). The graduates assigned nominally in the units of scientific research, engineering and projection, after the first two years of internship activities in socialist as well as schools and secondary school education, had to spend a third year of internship in the units they were assigned to. For most technical specializations, the number of engineering graduates was higher than the initial requests coming from ministries; eventually, all the graduates were distributed, although some to other jobs than the ones they were trained for.

The phrase ‘to ensure the stability of institutions of higher education

graduates, the jobs and the localities were they were assigned to' decided the prohibition of changes or transfers, and transfers or temporary allocation to other units or places were only possible with the approval of the Government committee (ANIC, CC-PCR-Propagandă şi Agitaţie, 26/1985, 3). Through personal efforts and recommendations, some young professionals succeeded in finding a permanent job in the capital city; but the overwhelming majority of recent graduates added to the vast majority who were sent in the economic, medical or education units at a considerable distance from their homes.

Case-study: the '23 August' Factory

The '23 August' Factory, the successor of 'N. Malaxa' Company was created between 1922 and 1924, and was created din order to repair locomotives and carriages; later, the factory came to build heavy locomotives, mixers, compressors, boilers etc.

In the period 1941-1944 the company 'Malaxa' made arms, initially for the Romanian army, after that, both military and civilian, for the USSR (guns, bombs, repair of tractors, cars, trucks, building a new series of locomotives) (ACNSAS, Documentar, 13856, vol. 1, 13). After the Nationalization Act (June 11, 1948) was decided to rename the economic unit in '23 August' and the factory passed to civilian production (locomotives, engines, pipes, cars, boilers, drilling rigs, presses, cement mills etc.). The factory became a major objective of the entire post-war industrial sector by producing and implementing new technologies or performance of parts and components based on the acquisition of foreign licenses. The factory assumed the role of the country's chief mechanic and distributed products which were necessary to the most factories from Romania; further, it delivered various export orders (wagons, cement lines, cars etc).

The development of the unit could also be observed in the structure of the group which formed the entire complex: locomotive factory, engine factory, heavy machinery factory, castings factory (iron foundries, steel, non-ferrous and alloys) and other auxiliary departments and research (ANIC, CC-PCR- Economică, 58/1973, 204). The allocation of large sums (165 million lei in the 1951-1955 five-year plan) increased the basic means one point five times and the accumulation production capacity of the main sections (motors/engines, boiler room, steel foundry, iron foundry); also, a considerable amount was dedicated to social-cultural constructions (non-family housing blocks, clinics, rehabilitation hospital, crèche and day nursery for children, a vocational school and a culture school, and four rest homes in Predeal) (ANIC, CC-PCR- Economică, 12/1958, vol. 1, 143).

Massive investments contributed to the modernization of the factory, increasing employees' production and professionalism; the amounts allocated were significant in the 1960s and 1970s (for example, during the 1966-1970 five-year plan 990 million lei were spent), but the volume was reduced in the 1980s for financial reasons. Moreover, in the last socialist

decade a policy was applied in order to improve activity and decrease the consumption of power and heat. Optimizing production was equivalent to the introduction of new technologies (increasing technological lines, industrial robots and automated lines, supplying new machines - tools and aggregates) and a 30 per cent reduction in the quantities of heat and electricity (some activities were carried out only in daylight, while manufacturing sectors were kept to a minimum) (ANIC, CC-PCR- Economică, 30/1987, 1-1v).

Substantial capital infusion in the first communist decades generated a number of positive effects, among which: maintaining and expanding production capacity, ensuring the internal market and export deliveries (especially locomotives and engines, drilling rigs/installations/equipment sent to Algeria, Costa Rica, Poland, the USSR, Hungary, the German Democratic Republic) (ACNSAS, Documentar, 13856, vol. 5, 216). Technological progress allowed for the diversification of products and access to international markets, but the economic vision of the last communist decade canceled, in a considerable way, the efforts; the pressure of external financial liabilities and insistent demands for lowering the cost of production generated poor quality products and countless foreign customer complaints. The Soviet partner asked for Romanian drilling rigs to be equipped with Western European engines; the East German also dropped the last 60 (out of 270 locomotives contracted) and Poland ceased to buy a total of 190 locomotives until the settlement of technical problems (ACNSAS, Documentar, 13856, vol. 5, 216-217).

Reducing the amount of exported products, due to their poor quality, led to special problems in ensuring the necessary funds for the working staff; the management decided to draw up fictitious documents which certified product performance, but which, if kept in stock, was worth over 2 billion lei (ACNSAS, Documentar, 13856, vol. 4, 240 and 255).

Human Capital

During the war, the '23 August' factory counted approximately 14,000 employees, but the number dropped to 8,000 in the decade 1948 - 1958 (about 50 per cent were employed between 1954 – 1958). In the factory (August 28, 1958), 311 engineers were employed [228 graduates from classes 1954 to 1957 (1954 - 30, 1955 - 38, 1956 - 74, 1957 - 86)] (ANIC, CC-PCR- Economică, 12/1958, 158-159); we should specify that 112 engineers worked as foremen, heads of workshops, heads of departments, managers; the ratio of engineers was adequate (about one to 20 workers). In terms of organizational experience and technical capability, it should have been strengthened. Both enterprises and ministries were concerned about hiring good professionals who could come from other sectors, and reduce the fluctuation of existing engineers.

The relationships between the employees of an economic unit were governed by three factors: decision making power, income and prestige. The factory management was in the hands of experienced engineers, and was completed by the other engineers

and foremen leaders (workshop leaders, heads of departments etc.). At any rate, the main functions were reserved for engineers, but foremen were also essential in production and in supervising the masses of workers. Another significant aspect referred to wage differences; workers' monthly income frequently exceeded the engineers' income. The explanation was the number of worked hours, the number of parts and other items made, and the advantageous payment scale. Prestige was quasi-present in the relationships between employees; a junior engineer was not heeded by a foreman, and experienced workers criticized the lack of practical skills of technical higher education graduates. However, engineers coming from among the workers were more respected. First they gained practical experience and then completed it with theoretical training in the Polytechnic Institute.

The constant factory development required additional work and technical personnel, especially technical staff with high school education; the number of employees reached 16,000 (in 1973) out of which 13,133 were workers (vocational school graduates), and the staff number continued to increase during the next decade to 19,880 (1987). The workers accounted for 83.87 per cent (16,081) followed by the productive technical staff (instructors, personal research and projection factories) 12.12 per cent (2,324), administration three point thirty-two per cent (637) and general service 130 (0.69 per cent) (ANIC, CC-PCR-Economică, 322/1987, 2-4).

The education level was a landmark in the relationships among employees; the primacy of staff orientation was explained both by the economic unit and by the economic and social policy of the state. Out of 16,081 workers, 2,249 graduated four primary classes, 2,615 – elementary seven classes, 1,739 – eight classes, 2,049 – 10 classes (compulsory education), 4,991 – vocational schools and 2,438 – secondary schools (ANIC, CC-PCR- Economică, 322/1987, 9). Higher education graduates accounted for 988 in production (613 engineers, 66 economists, 12 chemists, three physicists, one psychologist, one professor, two architects, two sociologists, 14 translators, 274 sub-engineers) and 243 in administration (75 engineers, 130 economists, four translators, 11 legal advisors, eight university professors, three sociologists, one psychologist, 11 sub-engineers); in production, employees with high school training were 900 (749 technical education, seven economic, 144 secondary/high school) and, while in administration there were 374 (120 technical, 90 economic, 164 secondary/high school), and 437 served as foremen(ANIC, CC-PCR-Economică, 322/1987, 10-11).

From the statistical summary of the 'Workforce' of the '23 August' Factory we found out that the mean weight of 6.19 per cent of the total licensed staff (1,231), and the engineers had 55.88 per cent of those with higher education (688); at the same time, the ratio engineers - workers was one to 23, higher than in the late 1950s. The gap increased both due to modernization and the increasing power held by foremen.

However, specialists with higher education were required because of the

need to implement new technologies. There was a preliminary step, i.e. internships during study years (third year students were also used at foundry, forge, lathe, while fourth year students handled a wider sector of production in order to get accustomed to the organization, management and control of the production process), followed by a trial period of two – three years. In many factories there were failures in the relations between students-employees, foremen-engineers, engineers-executive management.

Most students did not respect the schedule of work, on the one hand because of subjective causes, on the other hand due to the fact that indolent and indifferent tutors designated staff to coordinate practical activities. Documents of the time noted: 'Many students could be seen after the workers began to work, together at the main entrance, at the doors of workshops or in the offices to fill in their practical book, sometimes leaving the halls for a walk (23 August, Republica, CFR Timisoara workshops, Reşita Metallurgical Plant, Gh Dimitrov-Arad etc.) [...] There are students who have no basic knowledge of the production process [...] many Polytechnic Institute students from the ones working at the '23 August' factory signed the attendance register and then left immediately' (ANIC, CC-PCR-Propagandă şi Agitaţie, 7/1957, 34-35).

Thus, junior engineers' tasks were limited; foremen' role was significant in production activities. Moreover, the entire productive human ensemble, the foremen - engineers relations were the most susceptible (experience and conservatism of experienced employees were major obstacles in accepting suggestions coming from the beginner Engineering Corp). In addition to the tension situations between the two categories of personnel, mismanagement was also an important factor: the leaders of the unit used the 'financial bonus' method in order to save the expense on raw materials to the detriment of quality products, the division cash benefits (bonuses, the recovery of stolen property units, gifts, food and drink received from subordinates), the promotion of senior management on subjective criteria, keeping employees who did not fulfill their obligations, reporting false data on production.

In this context, the Securitatea bodies decided to open objective file no. 616 '23 August'. Surveillance was achieved both through direct officer business objective and indirect actions (collecting data of interest from the network of informants and collaborators). Monitoring the factory involved actions aimed on the one hand to signal any production problems, and, on the other hand, the operational interest manifested by some employees. The informative work was more easily conducted by following a standard procedure of specific activities: the creation of networks, the establishment of database work (informative surveillance, vulnerabilities, places and environments), recording failures and their causes.

After this typology proceeded the two or three objective officers, recognizable easy by all staff, especially that they were not conspiring. The documents of the Securitate indicate that the potential informative network consisted of 120 sources (86 informants, 21 collaborators and 13 residents) being supplemented, if

necessary, by other Securitate or Militia or National Defense officers placed in the factory. Surveillance was aimed at 318 employees (former members of the traditional parties or the Iron Guard, suspects who would have wanted to flee abroad, participants in hostile events, news-mongers from 'Free Europe'), but also dormitories (approx. 1,000 young people) or vulnerable areas (power station, furnaces, warehouses, test stand at polling engines) Data transmission occurred after the meetings between the officer and the informants ('networkers'), in hidden places, and relied either on written notes, or on the minutes.

Although there were significant about on the positions of employees, however, the major interests of Securitate workers focused on inappropriate productive activity. Reports contained in the file indicate that in the late communist decade, many irregularities were recorded, among which: the breach of execution terms, supply, design up to misconduct (absenteeism, unjustified absences, removal from public property).

Poor management (incapable and even corrupted directors) reflected the negative economic and financial situation during the first six months of 1988 as follows: the achievement indicator of production, goods sold and received: 58.1 per cent; the plan to export: 50 per cent; manufactured goods: 79.8 per cent; finished stock: 2,341,653 lei; unpaid invoices from internal customers due to contract failure (freight undelivered or delivered incomplete, qualitative deficiencies): 308,761,300 lei. The direct consequence was the decrease of wages by 10-30 per cent per month, which led to dissatisfaction with negative effects on quality production tasks. Note that reductions were limited to obtaining a funding line worth about 2 million lei (ACNSAS, Documentar, 13856, vol. 3, 315).

The main reasons for failure to fulfill the plan are the clumsy implementation of the modernization program (broken equipment, spoil or unacceptable delays in installation), recurring delays in starting the process of robotics of technology lines, poor quality of products manufactured in castings and the forgings factory (low quality raw materials and deficiencies manifested in technological discipline). The shortcomings in product performance and their doubtful quality, in the 1980s, were fined by external partners, and the cancelled contracts determined new negative wage corrections; during the year 1989, the staff remuneration was reduced by 10 per cent (ACNSAS, Documentar, 13856, vol. 3, 591).

The aspects mentioned in the documents of the Securitate were confirmed by the testimonies of engineers employed at the '23 August', especially lack of production, types of products made of low alloy, progressive reduction of raw materials or symbolic use of industrial robots at all times or major gaps in delivery orders (Speteanu, 2010). Unfortunately, the last communist decade went under the influence of the external debt and all sorts of privation experienced by the population; anyway, the failure of economic policies contributed to the end of the socialist system, in December 1989 (Murgescu, 2010: 401-407).

Conclusions

At the 23 August factory, higher education graduates were employed either in direct production (mostly the engineers), or in administrative and support services (economists, translators etc.). Initially, their position in the factory was weakened by their lack of experience, by the reluctance of managers and older foremen and qualified workers, as well as by the rigidities of the existing hierarchical structures. Of course, these handicaps could be gradually overcome, but this process needed time. Besides, because the regime insisted on the paramount importance of workers and on the quantitative dimension of production, the skills of higher education graduates to make production more efficient were not in particular high demand. In the context of the general crisis of the 1980s, this pattern became stronger, and, while productivity stagnated or even declined, many people in the factory perceived higher education graduates as too numerous or even useless.

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