



## MODEL OF COOPERATION OF THE SYSTEM OF STAFF EDUCATION FOR INDUSTRY – CONCEPTUAL FRAMEWORK OF EDUCATIONAL CLUSTER

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### Abstract:

Education of staff for industry in Poland is carried out in vocational education system in schools, responsible for education of qualified workers and in system of technical universities, responsible for engineering education. This article concentrates on aspects of education of qualified workers. There is presented model of cooperation institution responsible for vocational education for industry on the basis of concept of educational cluster. The first part of the article describes aims and determinants of cluster formulation. The second – model of structure of educational cluster, particularly: stakeholders of cluster (potential participants of cluster), scope of cooperation, information flows and stakeholders' activities. The last part of article discusses possibilities of implementation the model: (a) by creation educational strategies and (b) by caring out projects concentrated on particular problem.

*Key words:* education of staff, clusters, educational management, educational strategies

### INTRODUCTION

Education of staff for the industry in Poland is based on two complementary pillars: the system of vocational education at the Ministry of Education and the system of engineering education (system of universities of technology) under the Ministry of Science and Higher Education. This paper presents the conceptual framework of educational cluster, aimed at increasing the efficiency of staff training for industrial companies. The analyzes of this article concerns structures of employment directly related to production processes, such as qualified and skilled workers employed in the departments of production and maintenance services.

The educational system reform since 1999 has been based on decentralisation of management competitions. Effectively the local governments have been given more authority in creation, administration as well as co-financing of schools on primary and secondary level. As a result of transfer of competences of the central government to local governments expanded their scope of responsibilities, and moreover increased their responsibility for the educational system in their area: in the city, in the region.

Nowadays local governments are more responsible for education and they have more opportunities in management (especially in the formation of schools' nets) and more problems to solve. On the basis of mentioned changes to the most important educational problems for local governments belong: co-financing education, organisational supervisory, decisions connected with schools' nets: the amount of schools adapted to demographical situation, pupils' needs and government's abilities, decisions connected with vocational schools and occupations. Local governments at all levels are obliged to create educational policy, considering local conditions and local educational needs of citizens. There is no capacity for effective management of

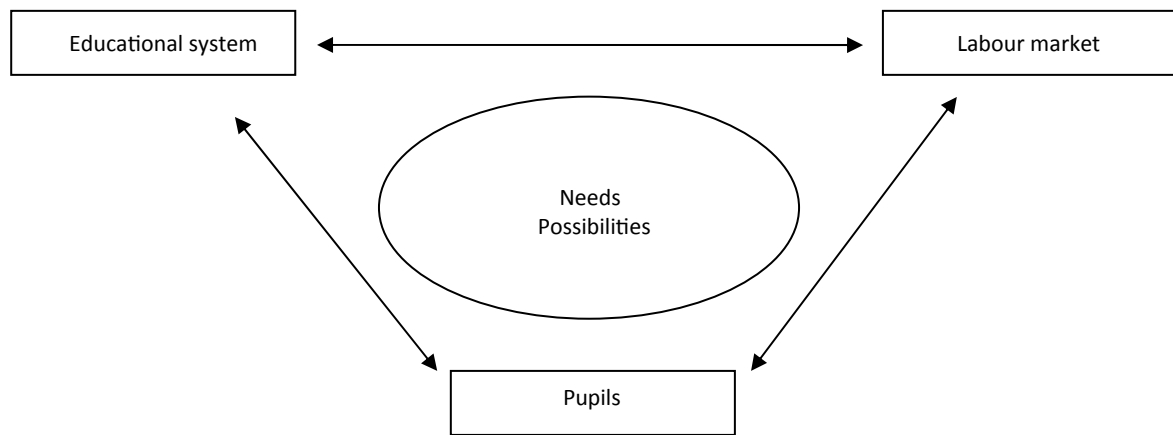
education at any level – central level, local government's level or school level – without cooperation with institutions of the environment. It is obvious for all participants in the education system but very difficult to implement. Thus, local authorities became responsible for the creation of the vocational education system adequate to the needs of entrepreneurs.

The objectives of local government activities are connected with searching answer for following questions: in what occupation?, in which schools?, how many classes are required to open to carry out education of qualified workers necessary for production departments? Opportunities of subsystem of vocational education are determined by infrastructure of schools and other educational institutions of particular local government and its human resources. Needs of labour market are very dynamic and not always possible to meet by educational system. Educational system to meet requirements of labour market must concentrate its activities on improving the quality of education [5] and related processes, e.g. processes of vocational and career advisory.

The objective of article is presentation of model of cooperation of institutions responsible for preparation of graduates to work in industry, created on the basis of conceptual framework of cluster initiative in education.

### CONCEPTUAL FRAMEWORK OF EDUCATIONAL CLUSTER

The most cited in the scientific literature definition of term 'cluster' was introduced by M. E. Porter [6], which indicates that cluster is 'a geographic concentration of interconnected business, suppliers, and associated institutions in a particular field. Clusters are considered to increase the productivity with which companies can compete, nationally and globally. The theory does not exclude creation of cluster initiatives in educational system area.



**Fig. 1 Assumptions for the creation educational cluster [8]**

Critical elements of the success of cluster, accordingly with „A Practical Guide to Cluster Development” [9] are mainly:

- Partnership – 80%.
- Innovative technologies – over 70%.
- Social capital – over 70%.
- Infrastructure – circa 40%.
- Presence of big companies – about 40%.
- Entrepreneurship – about 35 %.
- Access to financial sources – about 30%.

Although creation of clusters in a business domain the rules and procedures of creation can be adapted to public sector, including educational system area.

#### *The objective and assumptions of creation of educational system*

Local governments have institutional possibility to integrate educational system with the environment, especially in the area of creation cooperation networks with employers and other institutions of labour market. The article presents model structure of educational cluster, which is initiated by local government. The objective of this cluster is creation of the network cooperation of staff educational system for industry.

To this system belong: basic vocational schools, technical secondary schools, centres of vocational training and long life learning, employers – industrial companies and local governments.

The starting point for the development of the structure of educational cluster is a diagnosis of needs (1) and diagnoses of possibilities (2) in the three key areas: educational system, labour market and pupils (Fig. 1). The diagnosis is a task of local government. Identification of the needs and possibilities of the educational cluster stakeholders provides the local government knowledge on:

- expectations of pupils (including educational aspirations, fashion for specific fields of study, the influence of parents on the choices students) and their attitudes, abilities, which may not be relevant to the aspirations,
- the capacity of schools of education in certain directions, occupations and perspectives for the development of schools (needs) from the point of view of the directors, as well as the “hard” needs, including infrastructure and “soft” needs connected with development of skills and qualifications of school teachers)
- needs, requirements of labour market and employers.

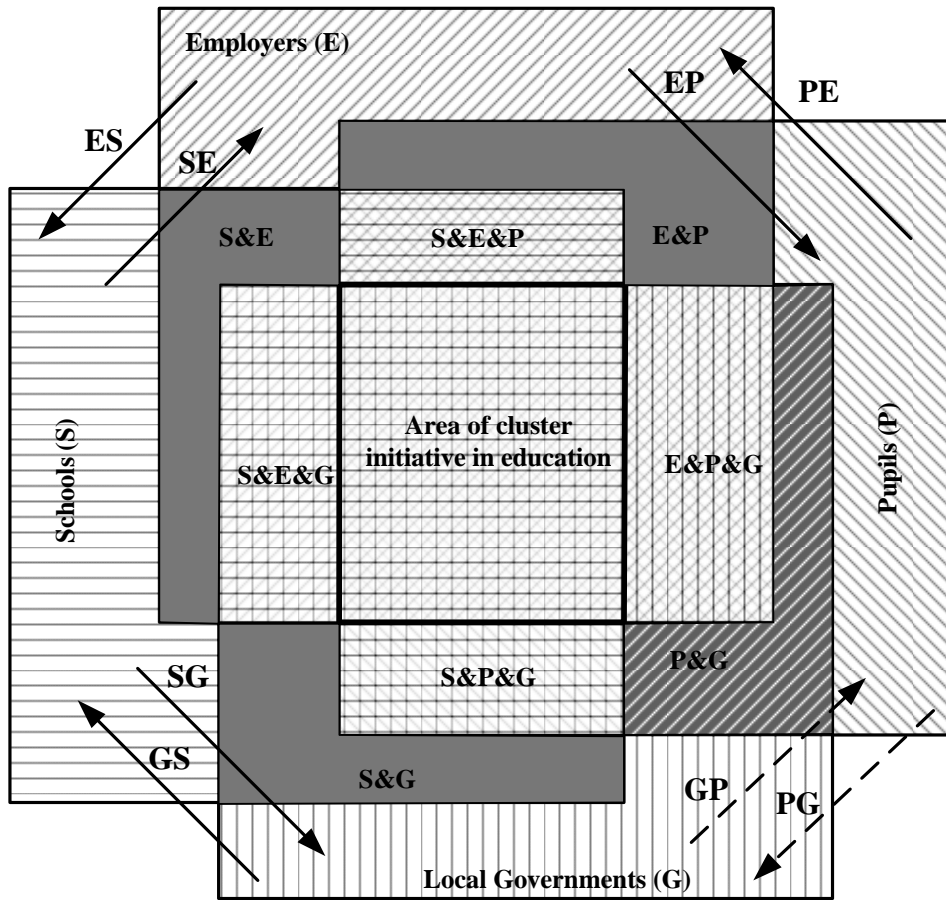
Local governments mainly have the knowledge belonging to the first two categories. They can also easy make a diagnose of these areas. Knowledge of determinants of employment on labour market is difficult to obtain. It depends on the nature and forms cooperation of local government, as well as school directors – with employers and labour market institutions. It is also big financial challenge. Data from recruitment offices in cities (*powiatowe urzędy pracy*) are not complete, more precise research are carried out by regional recruitment offices (*wojewódzkie urzędy pracy*), contain about 30% of market and its difficult to plan school nets on the basis of this data. In the same time vocational and career advisers do not have high quality information of requirements of labour market.

#### *Model of structure of educational cluster*

The Figure 2 shows the structure of the education cluster.

In the process of preparing young people to enter the labour market (stakeholders of educational cluster) were involved four groups of entities and individuals:

- Local government authorities and workers of department of education in cities’ councils.
- Representatives of educational system (educational area) – to this group belong school directors, teachers, particularly teachers of vocational classes, vocational and career advisers, vocational training tutors.
- Pupils and parents – pupils create their career paths (educational and vocational) and create process of decision making in this area. They are recipients of all activities of educational system. Their situation and decision-making processes affecting education management in the local government. On the level of secondary school the role of parents is much more lower then on the level of primary and lower-secondary school. Accordingly to the author’s research [10] 68.30% (N = 3835) interweaved pupils of secondary schools make decision on their career path by themselves. The role of parents becomes important in situations of conflict, when a parent intervention is needed in school director or in educational department in local government. However, these are rare situations and require an individual approach.
- Employers which employ graduates, accepting students for vocational training, employing young workers, implementing joint projects with educational institutions.



**Fig. 2 Model of information and decision structures of educational cluster**  
 Source: self study on the basis of [7]

The activities of all these groups and entities are targeted to meet their needs. Effective implementation of these activities will consequently improve the efficiency of vocational education focused in conjunction with the needs of the labour market.

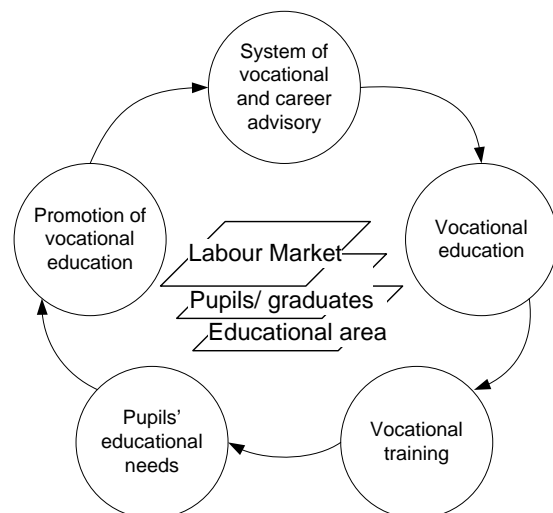
In the Fig. 2. sectors marked with S&E (schools and employers), E&P (employers and pupils), S&G (schools and local governments) presents current activity of educational system. Operations, processes and decisions carry out in those areas are the basis of effective functioning of educational system. Sectors S&E&G and E&P&G mean the same as S&P and S&G because – what was previously mentioned – pupils do not undertake direct activities with local governments.

Cluster initiative can be start by any participant of cluster initiative – a person or a institution – which is engaged in problems of vocational education and training and development of staff of lower-level in industry. Successful implementation of those activities demand engagement of four mentioned group people or organisations and undertake common and one-direction activities. Central part (Fig. 2) integrates activities of all stakeholders of cluster initiative.

The main tasks of the education cluster and sources of information required for management of the cluster are indicated in Figure 3.

There are close links between the five most important tasks of the education cluster. Effective implementation of all of them requires consistent actions aimed at meeting the needs of pupils and graduates, educational area and the labour market. Such system of tasks will have influence

on the development of vocational education in conjunction with labour market. Each task needs to formulate the details, it is necessary to define detailed activities and its contractors. For the clarity and transparency of notation the examples of process maps were presented in tables – lists of detailed activities (Table 1 and Table 2), where each activity have assigned contractors and coordinator (responsible for particular task). In a new financial perspective 2014-2020 many funds will be allocated for initiatives carried out by schools and educational institutions in cooperation with employers.



**Fig. 3 Model of activities of educational cluster**

**Table 1**  
**An example of process map and list of activities for creation effective system of vocational and career advisory**

DETAILED ACTIVITIES	COORDINATOR AND CONTRACTORS								
	Local government	School	Vocational and career advisers	Teachers	Pupils/parents	Employers	Recruitment offices	Centre of vocational training and long life learning	Ministry of education
1 The reorganization of the rules of employment – necessity of employment of vocational and career advisers in lower- secondary schools (full-time job)	C	x							
2 Promotion of vocational and career advisory	C	x							
3 Put in lower-secondary school full time program on vocational development and career planning	x	x							C
4 Diagnose of vocational skills and attitudes of lower-secondary schools pupils		C	x	x					
5 Provide for vocational and career advisers necessary equipment and organise infrastructure for individual consultations	C	x							
6 Put in lower-secondary school program elements of vocational development and career planning	C								C
7 School Career Centres (Szkolne Ośrodki Kariery – SZOKi) should coordinate activities of sub-system of vocational training	C		x						
8 Promotion and professional development of teachers in the area of vocational advisory	C	x	x	x					
9 Inform parents about advantages of diagnosis of educational-vocational competences and skills of pupils		C	x	x	x				
10 Invite parents into cooperation with vocational and career advisors. There is need to strengthen parents' role in processes of pupils' career planning		C	x	x	x				
11 Creation of platform of cooperation of schools' systems of vocational and career advisory, recruitment offices, centres of vocational training and long life training and employers	C		x			x	x	x	
12 Obtain external funds for projects on vocational and career advisory (e.g. EU funds)	x	x				x			

Author's research [7] indicated that most cluster initiatives in educational system are introduced by school directors. Despite many organisational duties they cooperate with employers, apply for external funds for the improvement of quality of education and for increase competitiveness of school.

### CREATION OF EDUCATIONAL CLUSTER

The model of structure of educational cluster presented in 1.2 will not be effective if there are not defined determinants and guidelines for implementation the model. Author proposes two ways of creation cluster initiatives:

- Creation and/or evaluation of educational strategy in local government,
- Implementation projects on particular problem and development of these projects.

#### *Educational strategy – a supporting tool for creation of educational cluster*

Work on the educational strategy is a good starting point to create educational. Both the creation of a new strategy and evaluation of already functioning should be associated with the inclusion of the education community

and the environment. Educational strategy will never fulfil its role when there are not only carried out public consultations but actions of involving of stakeholders in process of creation an educational strategy or other activities of rationalisation the educational system. Moreover, to the strategy – at any stage – can be includes new tasks correlated with main stream of education.

In scientific literature there are many concepts and ways of creation and implementation strategies. Author's research are based on model of S. Kielczewski [4] (Fig. 4).

After defining the main objective, which determines all strategies activities there is need to make strategic analysis, which contains: analysis of environment (external analysis) and analysis of educational system (internal analysis). Strategic environment is created by all institutions and organisations that have influence on functioning of the educational system: employers, organisations of employers, recruitment offices.

The most important factors of environment in the creation educational strategy, which should be taken into account in determining the principles of cooperation of the system of education of staff for industrial companies with local government:

A. PRADELA - Model of cooperation of the system of education for industry—conceptual framework for educational cluster

- economical, concerning financial situation on Country level and its perspectives of development,
- social, strongly connected with economical factors: situation on labour market (particularly graduates' situation on labour market), situation of marginalised citizens (or with threatens of marginalisation) and pathology, abilities of spending free time, perspectives of social advancement and career aspirations,
- demographic, very important in school nets planning. Decreasing number of children and demographic gap determines necessity of reduction of employment and making decisions connected with administration of empty school buildings. Costs of school per pupil are monitoring by all local governments. Dual analysis of demographical situation and of development of housing and citizens' migration is a background for making decisions on school nets development, including new schools planning,
- formal and legal, concerning constant changes of educational system regulations and necessity to adjust local regulations accordingly to government's regulations.

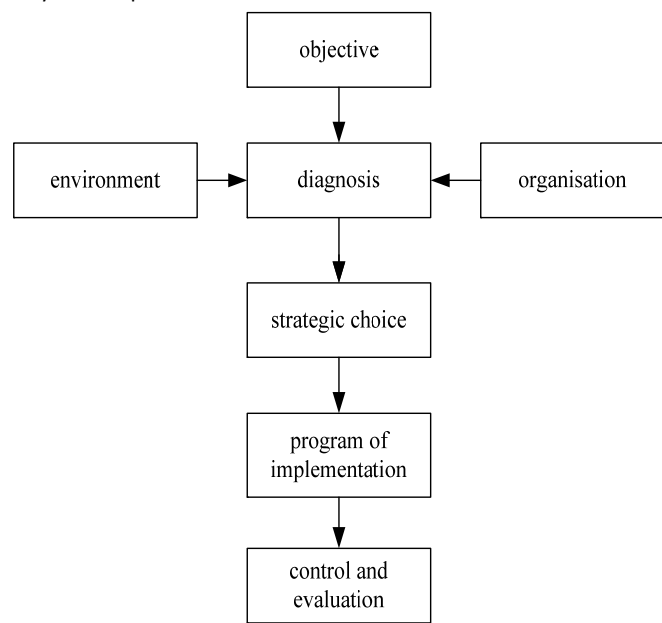


Fig. 4 Procedure of creation the strategy [4]

Any comprehensive analysis of the education system should contain information of: types of schools and educational institutions in particular local government, structure of employment (teachers and other staff), financial system, infrastructure. Depending on the size and scope of the internal analysis the strategy may include: system of vocational and career advisory or education in other schools functioning in local government.

The next step is to identify areas of priorities and objectives of the strategy. Each local government has a separate nomenclature, nevertheless the essence of this step is to determine the long-term activities, which are necessary and possible and it is possible to measure the objective. At this stage, it is very important to use participatory methods and invite and involve stakeholders to work on the strategy.

**Table 2**  
An example of process map and list of activities for rationalisation the system of vocational education

DETAILED ACTIVITIES		COORDINATOR AND CONTRACTORS								
		Local government	School	Vocational and career advisers	Teachers	Pupils/parents	Employers	Recruitment offices	Centre of vocational training and long life learning	Ministry of education
1	Evaluation of the offer of vocational education in particular local government	C	x	x	x				x	
2	Reorganisation of structure of school net of vocational schools	C	x		x				x	
3	Arrangement of structure of professions and specialisations in local government	C	x	x				x		C
4	Evaluation of educational programmes		C	x	x		x	x		C
5	Cooperation with employers - for their involvement in the teaching processes	C	C	x	x		x		x	
6	Evaluation and monitoring of vocational education - evaluation by employers	C	C	x	x		x	x		
7	Evaluation and monitoring of vocational training - evaluation by pupils	C	C	x		x				
8	Creation of a database of best practices and experiences in the field of restructuring of vocational education	x	C	x	x					
9	Research on employers needs of required qualifications and skills of workers	C		x			x			
10	Prognosis of deficit and surplus professions and occupations	C		x			x			

The lack of support of stakeholders hinder the implementation of any strategy. Implementation of the strategy should be accompanied by a process of strategic control. Its aim is to diagnose if objectives are achieved and to indicate required changes. It is possible to achieve when the strategic planning and control are treated as a coherent processes of gathering and processing information.

One of the tools of the implementation of strategy is Balanced Scorecard [2, 3]. Balanced Scorecard translates the mission and directions of the development of the specific objectives and measures grouped into four perspectives: financial, clients', internal processes and development. Evaluation of strategy and it's particular objectives is directly connected with evaluation of quality of education in schools [1].

To summarise, implementation of the system of education of staff for industry may be one of the tasks or priority of the education. The effectiveness depends on the inclusion of all stakeholders in the implementation process.

#### *From an idea to the education cluster*

The second concept of creation the educational cluster is to start from an idea or a problem. In this section, the author gives examples of the "best practices" that effectively develop the cluster initiative.

In the years 2007-2013 was carried out a number of interesting projects in the education system, co-funded by the European Union. The study provided new knowledge about the functioning of the various institutions of the educational system. They provided new forms of cooperation with schools and educational environment.

Project: „Labour Market of Gliwice City – challenges and chances”, carried out in Gliwice City between 2011-2012 (Social Capital 8.1.2), included precise research among employers (N = 216 respondents.), pupils (N = 4000), school directors and representatives of educational system (N = 70), focus research and experts panels. Report of research [7] became an interesting material for discussion for representatives of educational system and employers. The research report has become an interesting material for discussion for representatives of educational system and employers. Research provided diagnosis of educational system of Gliwice City, there were identified strengths and weaknesses and problems to solve. These issues were discussed at the expert panels brought further ideas to streamline the system of vocational education, particularly connected with improvement of vocational training. To new activities joined new employers and schools. The most important value added task of the project was transfer of research results to employers and the involvement of employers in the activities of educational system in Gliwice City.

A good example of the creation of cluster initiatives in the educational system is the cooperation of schools and mining companies. Both, Coal Main in Mysłowice, belonging Kampania Węglowa S.A and Jastrzębska Spółka Węglowa S.A. introduced cooperation with schools, where pupils are educated in mining professions and occupations. Before the reform of the education system in 1999, basic vocational schools and technical schools educated pupils in the professions of mining, then as a result of the liquidation of a number of vocational schools and intense promotion of general education, education in these competitions began to fade.

Lack of qualified young staff to work in the mines was the cause to initiate cooperation between schools and mines. The idea of a solution in Mysłowice and Jastrzębie Zdrój is analogous. Authorities of particular mine give information to schools in which jobs and professions and how many students they can employ after the cycle of school education. Schools in cooperation with the local government recruit and carry out education in response to the demands and requirements of companies. The advantage of this collaboration is to educate directly to the response to the companies' needs and the pupils have guaranty of the employment after graduation. They also receive an opportunity for professional development in their profession and occupation. Mining companies are very large employers and the perspectives of the employment are much easier to identify than in other industries or smaller companies. However, these activities are a good example to be implemented in smaller range and scope. In the example above, the main participants of the cluster initiative are all key stakeholder groups: the employer , the school , the pupils and the local government.

#### **SUMMARY AND CONCLUSIONS**

In the paper author has presented the model of cooperation of the system of education of staff for industry on the basis of conceptual framework of educational cluster. Paper presents theoretical determinant of creation educational clusters, the essence of processes of creation and its assumptions. Model of structures of educational cluster contains the most important groups of stakeholders engaged in problems of education qualified workers for industrial companies. Integrated system of five tasks allows to make precise analysis of the problem.

In the second part of article there are presented two ways of creation educational cluster: by creation educational strategies or by caring out projects on specific problems. Particular attention was paid to the need of use of participatory methods in creation cluster initiatives and the need of active involvement stakeholders of educational system to this process. education system.

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