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MOTIVATIONAL ASPECTS IN MANAGEMENT OF UPPER SECONDARY SCHOOLS

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ABSTRACT

The article presents and compares results of empirical studies of motivators of school directors with respect to school management, teachers with respect to work at schools, pupils with respect to studying at schools and parents with respect to a school selected by pupils. The studies were conducted in four complexes of upper secondary schools in Poland and two schools of a similar type in two countries: Germany and Spain. The study was conducted with the use of **Analytic Hierarchy Process** (AHP) method. Motivator models were built for school principals with respect to school management, teachers with respect to work at schools, pupils with respect to studying at schools, and parents with respect to a school selected by pupils; subsequently, the optimum model was selected. A comparative analysis was conducted of the empirical model with the optimum model and recommendations were presented for the motivator model for the needs of school management.

Key words: management, motivators, AHP, educational reform, comparisons, hierarchy

Introduction

The purpose of the article is analysis and evaluation of the system of motivators of school principals with respect to school management, teachers with respect to work at schools, pupils with respect to studying at schools and parents with respect to a school selected by pupils as a result of occurring changes caused by educational reform and proposal of motivator models for the needs of efficient school management. The presented results of empirical studies constitute an attempt at answering the question which motivators have fundamental significance within the scope of management of upper secondary schools.

The article describes the use of the **Analytic Hierarchy Process** (AHP) to diagnose motivations as one of the most important functions in the school management process exemplified by four selected complexes of Polish schools and their comparison with German and Spanish schools. The developed models are described: variants in the upper secondary school management practice. Recommendations are provided for improvement of management of upper secondary schools resulting from the analysis of the obtained study results.

Methods Applied in Motivation Studies

A method (Nowak, 1985, p. 19) is a specific, repetitive and learnt manner – a scheme or a model – of proceeding, consciously oriented towards implementation of a specific purpose via selection of means adequate for such purpose. On the other hand, according to T. Sułek (Sułek, 2002, p. 14) scientific methods encompass groups of means and activities in the form of principles – they are used for formulating problems, designing studies and collecting data for their solution, analysis and theoretical interpretation and presentation of data and practical use of substantial determinations and theoretical knowledge. The term method refers not only to the empirical part of studies, but also to formulation of explanations and structure of theory.

Among research methods applied most frequently in social sciences are: poll studies, questionnaire studies, experimental studies, methods of documentary studies, statistical verification methods and monographs. On the other hand, J. Sztumski (1995, p. 65, 66) divides research methods into:

- general: mathematical and cybernetic;

- empiric (detailed): comparisons, observations, analyses, syntheses, experiments, measurement;

and also divides methods on account of the structure of scientific cognition, where it is possible to differentiate two basic dimensions of science:

- empirical: observation, comparison, measurement, experiment;

- theoretical: specification, idealization, formalization and axiomatic method;

the third group encompasses methods equally useful in empirical cognition and theoretical cognition, such as: abstraction, analysis and synthesis, induction and deduction, modelling method, etc.

Measurement of stances (Oppenheim, 2004, p. 217, 232, 233,) utilizes the method of stance management with the use of scaling. These are methods of relative localization of persons with respect to each other within the scope of a certain continuum. Among classic methods of scaling measurement, there are the following scales: social distance, Thurstone, Likert, factor analysis of stance scales and scalograms. On the other hand, projective methods are particularly useful in the studies of stances (ibidem, p. 243) in disclosure of sources and motivational relations.

P. Forsyth provides the following methods for measuring motivation (Forsyth, 2004, p. 62):

- "management by supervision" (talking to employees, measurement of motivation status);

- opportunities for measurement;

- direct measurement with the use of specially constructed questionnaires;

- personal interviews.

Within the scope of solving multi-criteria problems, it is possible to find a lot of various methods in the literature (Adamus, Gręda, 2005a, p. 7). Among best known multi-criteria methods for supporting decisions, it is possible to list: multi-criteria programming, ELECTRE (*Elimination et Choice Translating Reality*) I and II, III, IV, PROMETHEE I and II, MAPPACC, PRAGMA, artificial neuron networks, DEA (*Data Envelopment Analysis*), elimination method, Markov chains, MCDA (*Multi-Criteria Decision Analysis*), AHP (*Analytic Hierarchy Process*) and ANP (*Analytic Network Process*).

Each of the above listed multi-criteria methods of decision making has its advantages, as well as restrictions. Among them, the best are AHP and ANP. Therefore, this article, apart from the presented methods, makes references to a multi-criteria decision-making tool: Analytic Hierarchy Process. This method allows for performance of an extensive problem analysis and making a decision among multiple variants, leading to its efficient solution.

Application of AHP Methods in Motivation Studies

Analytic Hierarchy Process (AHP) (W. Adamus, A. Gręda, 2005 a, p. 5 – 36) is one of the most rapidly developing and best known mathematical methods applied within the scope of solving multi-criteria decision-making problems. AHP combines certain concepts from the area of applied mathematics and cognitive psychology. It differs from other multi-criteria methods by three aspects which, at the same time, constitute its basic principles. These are: decomposition of a problem, expressing opinions via comparisons and hierarchic composition (synthesis) of priorities. The first principle determines the structure of a problem in a hierarchic form. The superior objective is placed at the top of the hierarchy; subsequent levels are occupied by criteria, the next one by sub-criteria, then by sub-sub-criteria, etc. Alternative decisions (variants, models, scenarios) create the lowest level of this structure.

The second principle indicates that direct comparisons of the degree of importance and preferences of elements are performed in pairs, on every level of the hierarchic structure, in relation to the joint criterion located at a directly higher level. These comparisons are aimed at evaluation of local priorities of elements in relation to such superior criterion. The so-called fundamental scale of comparison of Saaty is used for comparisons (T. L. Saaty, 2010, p. 105), which may be applied for analysis of both quantitative and qualitative variables. A nine-degree fundamental scale of comparisons is also applied and used in the study. Each number in the Saaty scale has its verbal and graphic equivalent determining the importance of compared elements.

The third principle regarding hierarchic composition (synthesis) of priorities consists in multiplication of local priorities of elements by global priorities of their joint criteria and, subsequently, adding such global priorities to the lowest elements (alternatives).

The result of all comparisons is an additive model constructed in the quotient scale, which describes a decision-maker's preferences. This model is called an additive priority function. An alternative decision to which the lowest total value of the priority function corresponds is believed to be the best and recommended to use in practice. During construction of models, the Pareto principle was used, according to which eighty percent of success is determined by twenty percent of performed activities (P. Buhler, 2002, p. 27).

In AHP, due to intellectual potential of man, it is recommended to limit the number of compared elements on every level of the hierarchy tree to 7+/-2. AHP introduces measurement of inconsistencies in comparisons in the form of inconsistency index C.I. or inconsistency coefficient C.R. In the AHP theory (T. L. Saaty, B. Cillo, 2008, p. 335), the acceptable value of C.R. is equal to or smaller than 10%. AHP, in comparison to other multi-criteria methods of decision support, has much greater practical application. In Poland, AHP has been applied since the mid 80's and interest in it has been continuously growing. The AHP method was used for: preparation of social and economic development strategy of agriculture and rural areas, forecasting the structure of primary energy in the fuel and energy balance of Poland for the year 2020, etc. According to W. Adamus (2005b, p. 17), thanks to simplicity, flexibility of application and high efficiency in analyzing and solving of multi-criteria decision problems, the AHP method may be very useful in rationalization of an organization and management of organizations, including solving of motivational problems.

Object of Studies

The object of studies was examination of the impact of transformation changes and the impact of educational reform (Act of January 8, 1999 introducing reform of education), on the system of managing upper secondary schools with special attention given to the function of motivation in the management process, determination of value hierarchy of motivator priorities: school principals for management of schools, teachers for working at schools, pupils for studying at schools and parents with respect to a school selected by pupils.

Motivators of School Principals

Modern social, economic and legal conditions determine new roles of a school principal within the scope of school management. Educational and employee tasks and rights of school principal are regulated by: Act of September 7, 1991 on the educational system, the Act of January 26, 1982 the Teachers' Chart, the Labour Code and numerous departmental regulations. The educational reform introduced in 1999 set the following requirements before school principals: the principal is responsible for development of his/ her own, individual concept of the school's operation, as well as has to ensure such organization of pedagogical supervision to enable control of achievement of standards that were set, increase in teachers' qualifications, in particular within the scope of organization of in-school training sessions (Reform of educational system. Draft, 1998, p. 34).

The principal creates a vision of the school, strategic plans and is responsible for current operation of a school. The most important thing is the ability to create a specific atmosphere in the school to make all teachers want to participate actively in the process of changes. A school principal is more than a manager – he/ she is a leader, who has to be able to make the employees follow him/ her and motivate teachers, take care of their professional development and lifelong learning (Dzierzgowska, 2000, p. 69).

A modern school principal has to play the role of a leader, a manager, a creative advisor and a good negotiator. His/ her principal task is constant improvement of the quality of school operation, motivating teachers to raise their qualifications and providing all the parties interested in participation of school life with the possibility of complete development and acquisition of skills (Kosińska, 1999, p. 6).

According to J. M. Michalak (2007a, p. 69), a school principal also plays the role of a leader, and in relation to it, he/ she should focus on:

– determination of a vision in relation to the needs of teachers, pupils, parents and local communities;

– ensuring that all the interested parties have to be fully involved in implementation of such vision and understanding of needs;

– delegation of tasks to others and creation of a situation which is conducive to co-management of a school by teachers.

W. Goriszowski (2008, p. 143), quoting A. L. Giunis, writes that the art of mobilizing people whom one manages, i.e. the art of motivating to undertaking additional efforts, is a very important managerial skill which determines the success of a superior in a significant degree.

Motivators of Teachers

All organizations are interested in what can be done to obtain a constant high level of results thanks to people. This means that special attention is paid to the best motivation of employees with the use of impulses, remuneration, leadership, work performed by them and the context within the scope of which a given work is performed. The purpose is creation of motivation process and such work environment which allows for making sure that individuals obtain results compliant with the management's expectations (Armstrong, 2000, p. 106).

Motivation of teachers is a process necessary to increase efficiency of their work and success of a school. How can teachers be motivated? There is no single universal motivation method. A school principal who wishes to motivate teachers should, first of all, get to know their needs, aspirations, talents, ambitions, passions and motives. According to T. Oleksyn, motivators (2006, p. 123) are factors of motivational impact: material and immaterial. The motivation system is a group of purposefully selected and logically connected motivators which make up a cohesive whole used for implementation of the mission and objectives of a given organization and take into account the actual needs and expectations of employees.

Professional satisfaction is an important term in psychology and work organization. Professional satisfaction results from situation at work and, at the same time, influences the quality of work. In majority, teachers have a positive attitude to their work and their level of satisfaction increases with work seniority (Piwowarski, 2009, p. 26).

Motivation of employees is directly influenced by work environment. It encompasses stances and activities of colleagues and superiors, as well as the "climate" which they create. Majority of people want friendship and appreciation on the part of colleagues and behave in a manner compliant with standards and values of their group (Goriszowski, 2008, p. 143).

Motivators of Pupils

The term motivation of pupils (Brophy, 2007, p. 17, 21) refers to subjective experiences of a pupil, in particular the pupil's willingness to become involved in classes and learning activities and causes of such involvement. Most modern views on motivation of pupils emphasise its cognitive features and purpose-orientation. In reference to science, motivational theories of objectives emphasize:

– significance of inter-human relations and learning in cooperation with respect to acceptance by the pupils of didactic objectives;

– avoidance of this type of pressure which makes the pupils willing to show off their skills and evade objectives.

According to J. Radwańska (2011, p. 54), it is important that the school environment appreciates factors conducive to development, self-fulfillment, correct relations of pupils and teachers and thereby influences internal motivation of pupils for studying.

On the other hand, according to the self-determination theory, people are, by nature, motivated to feel connection with other people in their social environment, to function efficiently in such environment and to show their personal initiative in this respect; in the case of pupils, internal motivation supports satisfaction of such needs as competences, autonomy and inclusion. In the motivation of pupils according to the expectation/ value model, pupils are encouraged to approve the value of activities constituting school studies and are convinced that they will deal well with such activities if they make a reasonably significant effort (ibidem, p. 29).

Motivators of Parents

One of the main principles of efficient quality management in schools is customer-orientation which, in this case, encompasses pupils' parents. Determination of current needs and expectations of pupils' parents with respect to educational services of a school is a very important activity, along with identification of expectations indicated by future parents. On account of growing violence and aggression in schools, pupils' parents pay special attention to safe school environment. A school should be able to respond to the needs of young people and constitute a safe haven for them, where they can study undisturbed and achieve good results (Day, 2008, p. 278). The parents expect the school to shape the atmosphere of mutual respect and trust between teachers and pupils, atmosphere of joy and satisfaction with successes of joint work (Roźnowska, 2000, p. 84).

Empirical Studies of Motivators of Managing and Managed Entities in Schools

Factors of empirical analysis in the management process

Study groups	Examined factors in the management process
School principals	• Motivating pupils to continuing studying. • Motivating teachers to self-development. • Evaluation of learning results. • Innovative teaching programmes. • Inspiring others to implementation of visions. • High educational requirements. • Delegation of rights.
Teachers	• Remuneration. • Security of employment. • Relations with pupils. • Relations with the school principal. • Relations with parents. • Possibility of personal development. • Work environment. • Participation in school management. • Vision and school mission.
Pupils	• Conditions of learning. • Relations of teachers towards pupils. • Relations of pupils towards teachers. • Relations with friends. • Special profile classes. • Vocational internship.
Parents	• Level of teaching and education. • Teaching conditions. • Trust to teachers' work. • Safety of pupils at school. • Foreign language learning.

Source: own study

Scope of studies

The following schools were qualified for the study on account of size and profile of teaching:

– Complex of Mechanical and Electric Engineering Schools of K. Pułaski in Częstochowa;

– Complex of Schools No. 1 of A. Towarnicki in Rzeszów;

– Complex of Vocational Schools No. 3 of A. Kocur in Katowice;

– Poviat Complex of Construction Schools in Oświęcim.

The following foreign schools were also included in the study:

– Jörg-Zürn-Gewerbeschule mit Berufsfachschule Berufskolleg u. Technische Gymnasium Überlingen Germany;

- Colegio Santa Maria del Pilar Saragossa Spain with which the Complex of Mechanical and Electric Engineering has cooperated with the scope of student exchange programme.

Extension of the study onto foreign schools has significantly enriched the empirical material and enabled comparisons within the scope of management of the German school (old EU member state), the Spanish school (a country with average membership status in the EU) and the Polish school (new EU member state). In relation to the fact that Polish education is aiming for achievement of educational standards binding in the EU, the studies conducted in the German and Spanish school may contribute to determination of directions of changes in management of education.

Breakdown of examined schools and their entities

No.	Name of school	Principals and principal assistants	Teachers	Pupils	Parents	Total
1.	Complex of Mechanical and Electric Engineering Schools Częstochowa	4	20	23	20	67
2.	Complex of Schools No. 1 Rzeszów	4	20	25	20	69
3.	Complex of Vocational Schools No. 3 Katowice	3	21	24	17	65
4.	Poviat Complex of Schools No. 5 Oświęcim	4	20	24	25	73
5.	Berufskolleg Überlingen (Germany)	1	9	20	23	53
6.	Colegio Santa Maria Saragossa (Spain)	4	17	25	25	71
	TOTAL	**20**	**107**	**141**	**130**	**398**

Source: own study on the basis of conducted research

Questionnaire interviews were conducted personally by the author in 2007 with principals of the examined schools, teachers, pupils and parents in four Polish schools. In the German and Spanish schools, interviews were conducted by teachers of these schools trained by the author during their stay in Częstochowa as a part of the pupil exchange programme of the Complex of Mechanical and Electric Engineering Schools.

Study Methods

The study makes use of multi-criteria mathematic method of decision-making support: the Analytic Hierarchy Process. The Expert Choice programme was used for calculations. The study tool – a questionnaire - which played the leading role was prepared on the basis of the entire hitherto knowledge on the organization and management in education and modern pedagogical, psychological and sociological knowledge related to the school management process. Ancillary methods, such as analyses and criticism of literature, document study method and statistical methods were also used.

Synthesis of Study Results

Studies on motivation of entities managing an upper secondary school and managed entities make use of the Analytic Hierarchy Process (AHP) for the first time. For calculation and determination of hierarchy of motivators and logic nature of answers (CR) of the examined entities, the Expert Choice programme was used. Motivator values of school principals, teachers, pupils and parents in four Polish schools were compared; hierarchy of motivators in Polish schools was determined (as the arithmetic mean) and hierarchy

of priority values of motivators of the above-described entities was described in all the examined Polish and foreign schools. The tables below present results of the conducted studies.

Motivators of school principals in school management

Table 1. Motivator priorities of school principals in school management in the examined Polish schools

No.	Criteria	Schools				Arithmetic mean
		1	2	3	4	
1.	Motivating pupils to continuing studying	0.142	0.022	0.023	0.069	0.064
2.	Motivating teachers to self-development	0.122	0.425	0.198	0.092	0.208
3.	Evaluation of teaching results	0.128	0.041	0.198	0.184	0,138
4.	Innovative teaching programmes	0.045	0.159	0.092	0.023	0.080
5.	Inspiring others to implementation of vision	0.062	0.108	0.176	0.184	0.133
6.	High educational requirements	0.275	0.130	0.246	0.293	0.236
7.	Delegation of rights	0.226	0.115	0.067	0.155	0.141

Source: own study on the basis of conducted research

1. Complex of Mechanical and Electric Engineering Schools in Częstochowa
2. Complex of Schools No. 1 in Rzeszów
3. Complex of Vocational Schools No. 3 in Katowice
4. Poviat Complex of Schools No. 5 in Oświęcim

Table 2. Hierarchy of priority values (arithmetic mean) of motivators of school principals in management of Polish schools

No.	Criteria	Priorities [Pi]
1.	High educational requirements	0.236
2.	Motivating teachers to self-development	0.208
3.	Delegation of rights	0.141
4.	Evaluation of teaching results	0.138
5.	Inspiring others to implementation of vision	0.133
6.	Innovative teaching programmes	0.080
7.	Motivating pupils to continuing studying	0.064

Source: own study on the basis of conducted research

According to the analysis of priority values of motivators of the examined principals of Polish schools, the most important criteria are high educational requirements and motivating teachers to self-development. The last place in the hierarchy of priorities is occupied by motivating pupils to continuing studying.

Table 3. Comparison of hierarchy of motivators expressed as numerical priorities of principals of Polish schools (arithmetic mean) – priorities from four schools, and German and Spanish school in school management

	Principals of Polish schools		Principal of the German school		Principal of the Spanish school	
No.	**Criterion**	**Priorities [Pi]**	**Criterion**	**Priorities [Pi]**	**Criterion**	**Priorities [Pi]**
1.	High educational requirements	0.236	Motivating pupils to continuing studying	0.417	Innovative teaching programmes	0.276
2.	Motivating teachers to self-development	0.208	Motivating teachers to self-development	0.294	Delegation of rights	0.229
3.	Delegation of rights	0.141	Evaluation of teaching results	0.134	Motivating teachers to self-development	0.146
4.	Evaluation of teaching results	0.138	High educational requirements	0.058	High educational requirements	0.141
5.	Inspiring others to implementation of vision	0.133	Inspiring others to implementation of vision	0.042	Motivating pupils to continuous learning	0.094
6.	Innovative teaching programmes	0.080	Innovative teaching programmes	0.030	Inspiring others to implementation of vision	0.085
7.	Motivating pupils to continuing studying	0,064	Delegation of rights	0.025	Evaluation of teaching results	0.029

Source: own study on the basis of conducted research

In comparison of priorities of principals of Polish schools with the priorities of principals of the German and Spanish school, the most important criteria for the Polish principals in school management are high educational requirements; for the German principal, the most important criterion is motivation of pupils to continuing studying. For the Spanish school principal, the most important criteria are innovative teaching programmes. On the other hand, the least important criteria for Polish principals in school management are motivating pupils to continuous learning and for the German: delegation of rights. For the Spanish principal, the least important criteria include evaluation of teaching results.

Motivators of Teachers for Work at Schools

Table 4. Motivator priorities of teachers in the examined Polish schools regarding work at schools

No.	Criteria	Schools				Arithmetic mean
		1	2	3	4	
1.	Remuneration	0.079	0.104	0.136	0.075	0.098
2.	Security of employment	0.156	0.130	0.186	0.115	0.146
3.	Relations with pupils	0.119	0.126	0.092	0.104	0.110
4.	Relations with school principal	0.121	0.148	0.108	0.142	0.129
5.	Relations with parents	0.098	0.105	0.069	0.080	0.088
6.	Possibility of self-development	0.121	0.148	0.141	0.160	0.143
7.	Work environment	0.147	0.091	0.110	0.147	0.125
8.	Participation in school management	0.068	0.073	0.077	0.072	0.073
9.	Vision and school mission	0.091	0.075	0.081	0.105	0.088

Source: own study on the basis of conducted research

1. Complex of Mechanical and Electric Engineering Schools in Częstochowa
2. Complex of Schools No. 1 in Rzeszów
3. Complex of Vocational Schools No. 3 in Katowice
4. Poviat Complex of Schools No. 5 in Oświęcim

Table 5. Hierarchy of values of motivator priorities of teachers in Polish schools (arithmetic mean) with respect to work at schools

No.	Criterion	Priority[Pi]
1.	Employment security	0.146
2.	Possibility of personal development	0.143
3.	Relations with school principal	0.129
4.	Work environment	0.125
5.	Relations with pupils	0.110
6.	Remuneration	0.098
7.	Relations with parents	0,088
8.	Vision and mission of school	0.088
9.	Participation in school management	0.073

Almost all of the examined teachers in Polish schools listed the following criteria as having highest priority: security of employment and possibility of personal development. Participation in school management had lowest priority.

Table 6. Comparison of hierarchy of values of motivator priorities of teachers of Polish schools (arithmetic mean) and German and Spanish schools with respect to work at school

	Polish teachers		German teachers		Spanish teachers	
No.	**Criterion**	**Priority**	**Criterion**	**Priorytet**	**Criterion**	**Priorytet**
1.	Security of employment	0.146	Possibility of personal development	0.271	Possibility of personal development	0.182
2.	Possibility of personal development u	0.143	Relations with pupils	0.231	Employment security	0.180
3.	Relations with school principal	0.129	Vision and school mission	0.141	Relations with pupils	0.128
4.	Work environment	0.125	Relations with school principal	0.081	Remuneration	0.126
5.	Relations with pupils	0.110	Security of employment	0.071	Work environment	0.102
6.	Remuneration	0.098	Work environment	0.062	Participation in school management	0.090
7.	Relations with parents	0.088	Relations with parents	0.061	Vision and school mission	0.082
8.	Vision and school mission	0.088	Remuneration	0.041	Relations with school principal	0.080
9.	Participation in management	0.073	Participation in management	0.041	Relations with parents	0.030

Source: own study on the basis of conducted research

For the examined German and Spanish teachers, the most important criterion of satisfaction with work at school is the possibility of personal development, whereas for Polish teachers this criterion is employment security. For Polish and German teachers, the least important criterion is participation in school management and for Spanish teachers the least important criteria are relations with parents.

Motivators of Pupils for Studying at Schools

Table 7. Priorities of factors motivating pupils to study at examined Polish schools

No.	**Criteria**	**Schools**				**Arithmetic mean**
		1	**2**	**3**	**4**	
1.	Teaching conditions	0.095	0.069	0.110	0.148	0.105
2.	Relations of teachers towards pupils	0.148	0.199	0.158	0.128	0.158
3.	Relations of pupils towards teachers	0.124	0.116	0.108	0.166	0.129
4.	Relations with friends	0.354	0.432	0.249	0.203	0.310
5.	Special profile classes	0.137	0.089	0.107	0.178	0.128
6.	Vocational internship	0.142	0.095	0.268	0.177	0.170

Source: own study on the basis of conducted research

Table 8. Hierarchy of priorities (arithmetic mean) of motivators of pupils to study in Polish schools

No.	Criteria	Priorities [Pi]
1.	Relations with friends	0.310
2.	Vocational internship	0.170
3.	Relations of teachers towards pupils	0.158
4.	Relations of pupils towards teachers	0.129
5.	Special profile classes	0.128
6.	Conditions of studying	0.105

Source: own study on the basis of conducted research

The most important factor motivating pupils to studying at schools is the criterion of relations with friends and vocational internship, whereas the least important criteria are conditions of studying and special profile classes.

Table 9. Comparison of motivating factors expressed by numerical priorities of pupils of Polish schools (arithmetic mean of priorities from four schools) and German and Spanish school to study at schools

	Polish pupils		German pupils		Spanish pupils	
No.	**Criterion**	**Priority**	**Criterion**	**Priority**	**Criterion**	**Priority**
1.	Relations with friends	0.310	Relations with friends	0.343	Relations with friends	0.376
2.	Internship	0.170	Internship	0.174	Relations of teachers towards pupils	0.174
3.	Relations of teachers towards pupils	0.158	Relations of pupils towards teachers	0.134	Internship	0.124
4.	Relations of pupils towards teachers	0.129	Special profile classes	0.128	Relations of pupils towards teachers	0.123
5.	Special profile classes	0.128	Relations of teachers towards pupils	0.126	Special profile classes	0.102
6.	Conditions of studying	0.105	Conditions of studying	0.095	Conditions of studying	0.101

Source: own study on the basis of conducted research

The criterion of relations with friends is of equal importance for the pupils of Polish, German and Spanish schools; the least important criteria for all the examined pupils are studying conditions.

Motivators of parents with respect to studies at a school selected by pupils

Table 10. Satisfaction priorities of parents with respect to a school selected by pupils in the examined Polish schools

No.	Criteria	Schools				Arithmetic mean
		1 [Pi]	2 [Pi]	3 [Pi]	4 [Pi]	
1.	Level of teaching and education	0.202	0.198	0.276	0.229	0.226
2.	Conditions of studying	0.122	0.089	0.121	0.204	0.134
3.	Trust to teachers' work	0.185	0.183	0.161	0.163	0.173
4.	Safety of pupils at school	0.255	0.326	0.328	0.232	0.285

Source: own study on the basis of conducted research

1. Complex of Mechanical and Electric Engineering Schools in Częstochowa
2. Complex of Schools No. 1 in Rzeszów
3. Complex of Vocational Schools No. 3 in Katowice
4. Poviat Complex of Schools No. 5 in Oświęcim

Table 11. Hierarchy of priority values [Pi] (arithmetic mean) in Polish schools of motivators of parents with respect to the school selected by pupils

No.	Criteria	Priorities [Pi]
1.	Safety of pupils at school	0.285
2.	Level of teaching and education	0.226
3.	Foreign language courses	0.182
4.	Trust to teachers' work	0.173
5.	Conditions of studying	0.134

Source: own study on the basis of conducted research

For the examined parents of pupils in Polish schools, the most important criterion is safety of pupils at schools, whereas the least important are the conditions of studying.

Table 12. Comparison of satisfaction hierarchy of parents expressed by numerical priorities of parents of pupils in Polish schools (arithmetic mean of priorities from four schools), and German and Spanish school with respect to a school selected by pupils

	Parents of pupils in Polish schools		Parents of pupils in German school		Parents of pupils in Spanish school	
No.	Criterion	Priority	Criterion	Priorytet	Criterion	Priority
1.	Safety of pupils at school	0.285	Level of teaching and education	0.261	Foreign language courses	0.334
2.	Level of teaching and education	0.226	Foreign language courses	0.245	Level of teaching and education	0.275
3.	Foreign language courses	0.182	Trust to teachers' work	0.205	Trust to teachers' work	0.145
4.	Trust to teachers' work	0.173	Safety of pupils at school	0.165	Conditions of studying	0.139
5.	Conditions of studying	0.134	Conditions of studying	0.124	Safety of pupils at schools	0.107

Source: own study on the basis of conducted research

For parents of pupils in the German school, the most important criterion was the level of teaching and education, whereas for Spanish parents the criterion of foreign language courses; for Polish parents, the most important criterion was safety of pupils at school. The least important criteria for German parents, as well as for Polish parents, are the conditions of teaching, whereas for the Spanish parents the criterion of safety of pupils at school.

Motivator Models in School Management

As a result of the conducted analysis of the hierarchy process, results of the conducted analysis of hierarchy process were presented and prepared in the form of motivator models (variants) for the examined schools: of school principals with respect to school management, teachers with respect to work at schools, pupils with respect to studying at schools and parents with respect to schools selected by pupils. An empirical model of motivators was compared with the optimum model of motivators for all examined groups and conclusions resulting from such comparisons were presented. Values obtained from the constructed motivator models of the examined criteria were used to choose the best variant – model with respect to school management, as well as solving of motivation problems. It was indicated which factors have influenced selection of an optimum decision-making variant in a greatest degree and directions of further improvement with respect to improved management of an upper secondary school.

The last activity performed in the course of solving a research problem was formulation of conclusions which were presented within the scope of motivators of directors of schools in school management, motivators of teachers with respect to work at school, factors motivating pupils to study at a school and motivators of parents with respect to the school selected by pupils, along with recommendations regarding improved management of upper secondary schools resulting from analysis of the obtained study results.

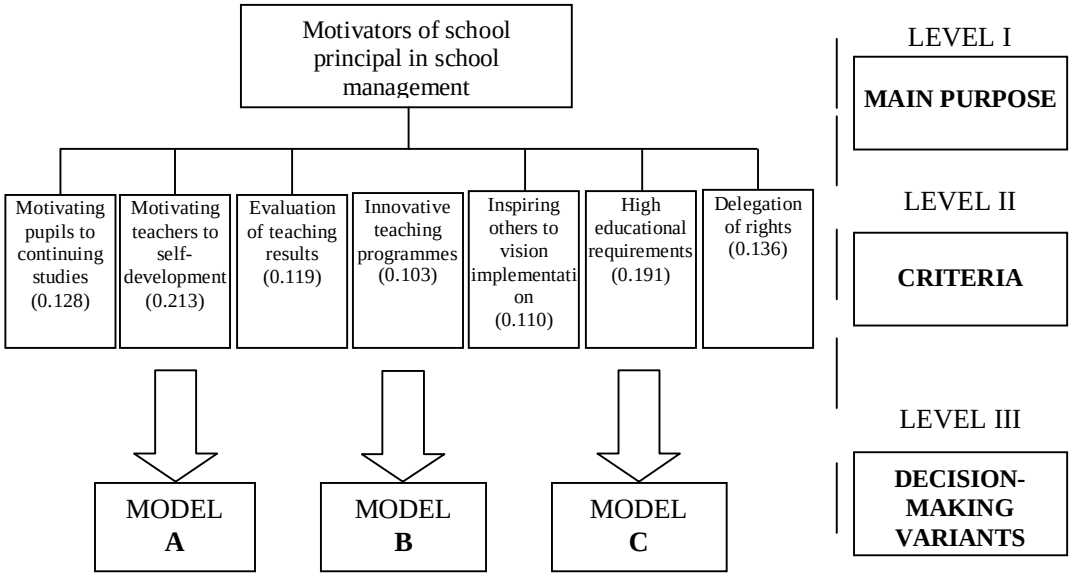
Drawings (1-4) present the hierarchy model of motivators of directors, teachers, pupils and parents in line with the AHP method.

At the top of each drawing, there is level I which is the main purpose where motivators are contained. Level II contains main criteria which comply with the main purpose. Domination of individual criteria was performed by verbal comparisons of individual criteria. Examined directors, teachers, pupils and parents compared all criteria in pairs, each with each. All of them had to compare motivating factors among them and determine the degree in which they influence motivation of management, satisfaction with work, studying and the selected school. Subsequently, verbal comparisons were changed into numerical comparisons using the fundamental scale of comparisons of T. L. Saaty. At the bottom of figures **(1-4)**, alternative motivator models are marked: of school principals with respect to school management, of teachers with respect to work at school, of pupils with respect to studying at schools and satisfaction of parents with the school selected by pupils.

Subsequently, numerical comparisons were presented in the cubical matrix of comparisons from which priorities were calculated (with the use of Expert Choice) for each Pi criterion and the inconsistency coefficient of comparisons CR. Falsification (rejection) of interviews was conducted, whose value of the CR coefficient was higher than 10% (T.L. Saaty, B. Cillo, 2008, p. 335). Numerical values of priorities for the examined entities from all schools are presented jointly in **Tables (3-12).**

Motivator models of school principals

Fig. 1. Hierarchy motivator model of school principals in management of upper secondary schools (AHP)



Source: own study on the basis of conducted research

Selection of optimum motivators of a school principal with respect to school management is determined in the B motivation model which has the greatest number of global priorities.

Table 13. Motivator priorities of school principals with respect to school management in a model approach

No.	Competences of principals	Model	Pi Priorytet	Model		
				A	**B**	C
1.	Motivating pupils to continuing studies (0.128)	A	0.455	0.059		
		B	0.455		**0.059**	
		C	0.090			0.011
2.	Motivating teachers to self-development (0.213)	A	0.063	0.013		
		B	0.753		**0.160**	
		C	0.184			0.039
3.	Evaluation of teaching results (0,119)	A	0.111	0.013		
		B	0.778		**0.092**	
		C	0.111			0.013
4.	Innovative teaching programmes (0.103)	A	0.143	0.014		
		B	0.714		**0.073**	
		C	0.143			0.015
5.	Inspiring others to vision implementation (0.110)	A	0.143	0.015		
		B	0.143		**0.015**	
		C	0.714			0.078
6.	High educational requirements (0.191)	A	0.753	0.143		
		B	0.184		**0.035**	
		C	0.063			0.012
7.	Delegation of rights (0.136)	A	0.063	0.009		
		B	0.184		**0.025**	
		C	0.753			0.102
∑	1,000			0.266	**0.459**	0.269

Source: own study on the basis of conducted research

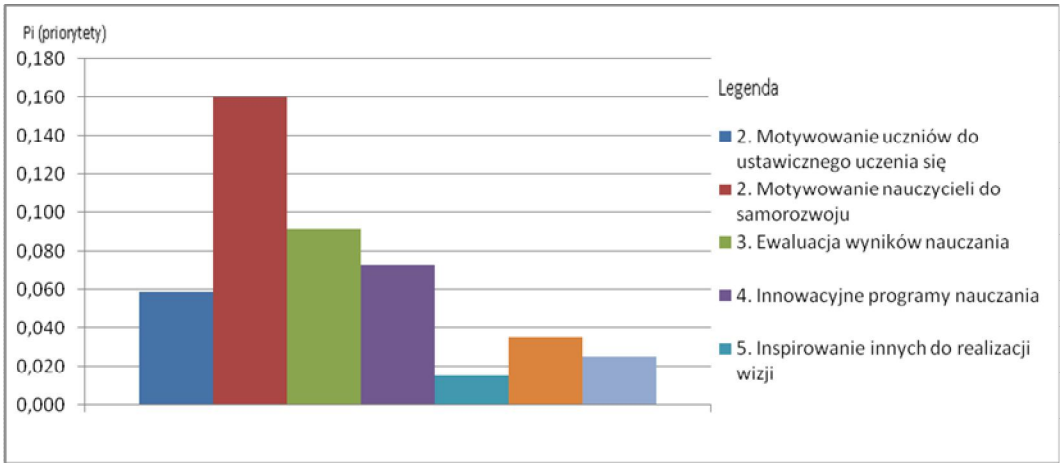
The constructed optimum motivator model of a school principal with respect to school management is a tool used to shape the motivators of a school principal with respect to school management.

Table 14. Hierarchy of motivator priorities of school principals in school management in the optimum model approach (Model B)

No.	Criteria	Global priorities
1.	Motivating teachers to self-development	0.160
2.	Evaluation of teaching results	0.092
3.	Innovative teaching programmes	0.073
4.	Motivating pupils to continuing studies	0.059
5.	High educational requirements	0.035
6.	Delegation of rights	0.025
7.	Inspiring others to vision implementation	0.015

Source: own study on the basis of conducted research

Fig. 2. Optimum motivator model of principals within the scope of school management (Model B)



Pi (priorities)

Legend:

2. Motivating pupils to continuing studies

2. Motivating teachers to self-development

3. Evaluation of teaching results

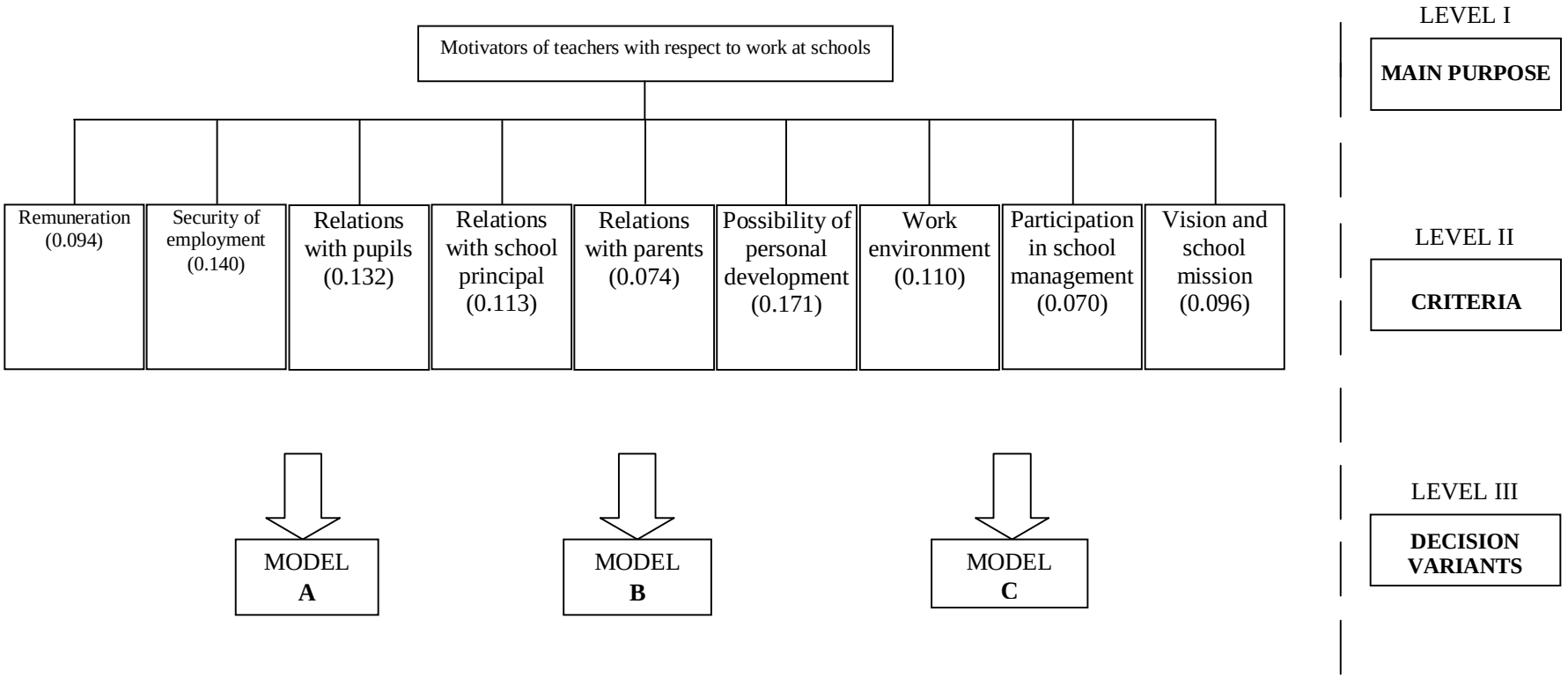
4. Innovative teaching programmes

5. Inspiring others to vision implementation

Source: own study on the basis of conducted research

Motivator Models of Teachers

Fig. 2. Hierarchy model of teachers' motivators to work at school (AHP)



Source: own study

Selection of optimum motivators of teachers with respect to work at school is determined by the B motivation model, which has the greatest sum of priorities.

Table 15. Priorities (Pi) of teachers' motivators with respect to work at school in a model approach

No.	Motivator criteria	Models	Pi (priorities)	Model		
				A	B	C
1.	Remuneration (0.094)	A	0.163	0.015		
		B	0.540		**0.050**	
		C	0.297			0.028
2.	Security of employment (0.140)	A	0.090	0.013		
		B	0.455		**0.064**	
		C	0.455			0.064
3.	Relations with pupils (0.132)	A	0.111	0.015		
		B	0.778		**0.103**	
		C	0.111			0.015
4.	Relations with principal (0.113)	A	0.753	0.085		
		B	**0.063**		**0.007**	
		C	**0.184**			0.021
5.	**Relations with parents (0.074)**	**A**	**0.143**	0.010		
		B	**0.714**		**0.053**	
		C	**0.143**			0,010
6.	**Possibility of personal development (0.171)**	**A**	**0.778**	0.133		
		B	**0.111**		**0.019**	
		C	**0.111**			0.019
7.	**Work environment (0.110)**	**A**	**0.111**	0.012		
		B	**0.111**		**0.012**	
		C	**0.778**			0.086
8.	**Participation in school management (0.070)**	**A**	**0.143**	0.010		
		B	**0.714**		**0.050**	
		C	**0.143**			0.010
9.	**Vision and school mission (0.096)**	**A**	**0.455**	0.044		
		B	**0.090**		**0.008**	
		C	**0.455**			0.044
		Σ = 1		0.337	**0.366**	0.297

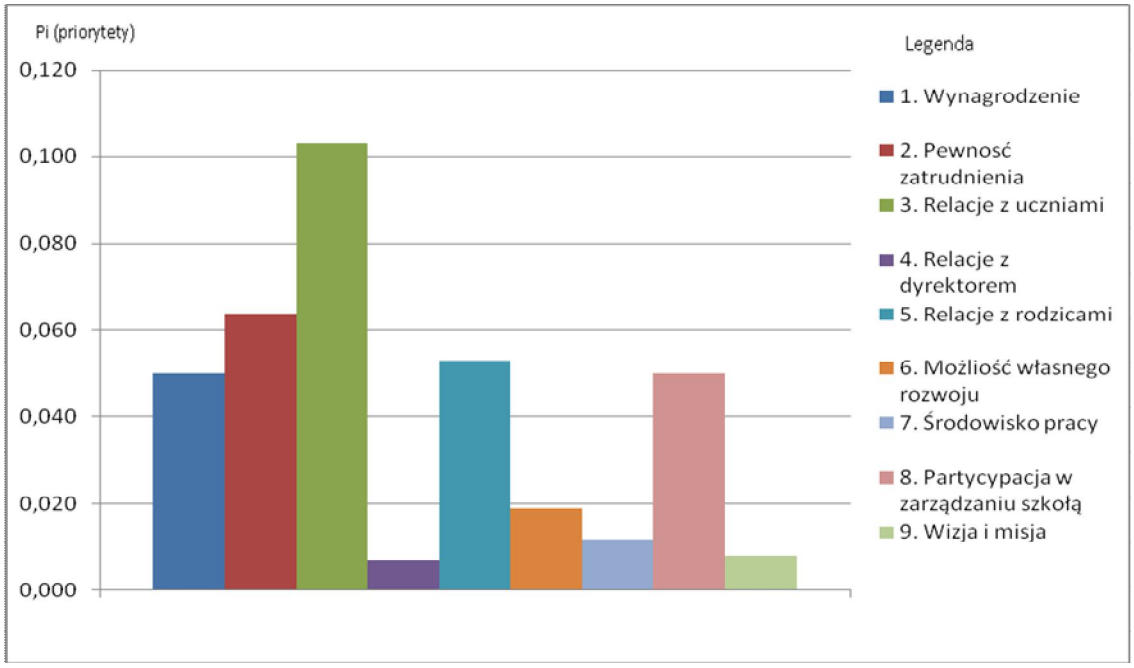
Source: own study on the basis of conducted research

Table16. Hierarchy of teachers' motivators with respect to work at school in an optimum model [Model B]

No.	Criterion	Priority [Pi]
1.	Relations with pupils	0.103
2.	Security of employment	0.064
3.	Relations with parents	0.053
4.	Remuneration	0.050
5.	Participation in school management	0.050
6.	Possibility of personal development	0.019
7.	Work environment	0.012
8.	Vision and school mission	0.008
9.	Relations with principal	0.007

Source: own study on the basis of performed research

Fig. 4. Optimum model of teachers' motivators to work at school (Model B)



Pi Priorities

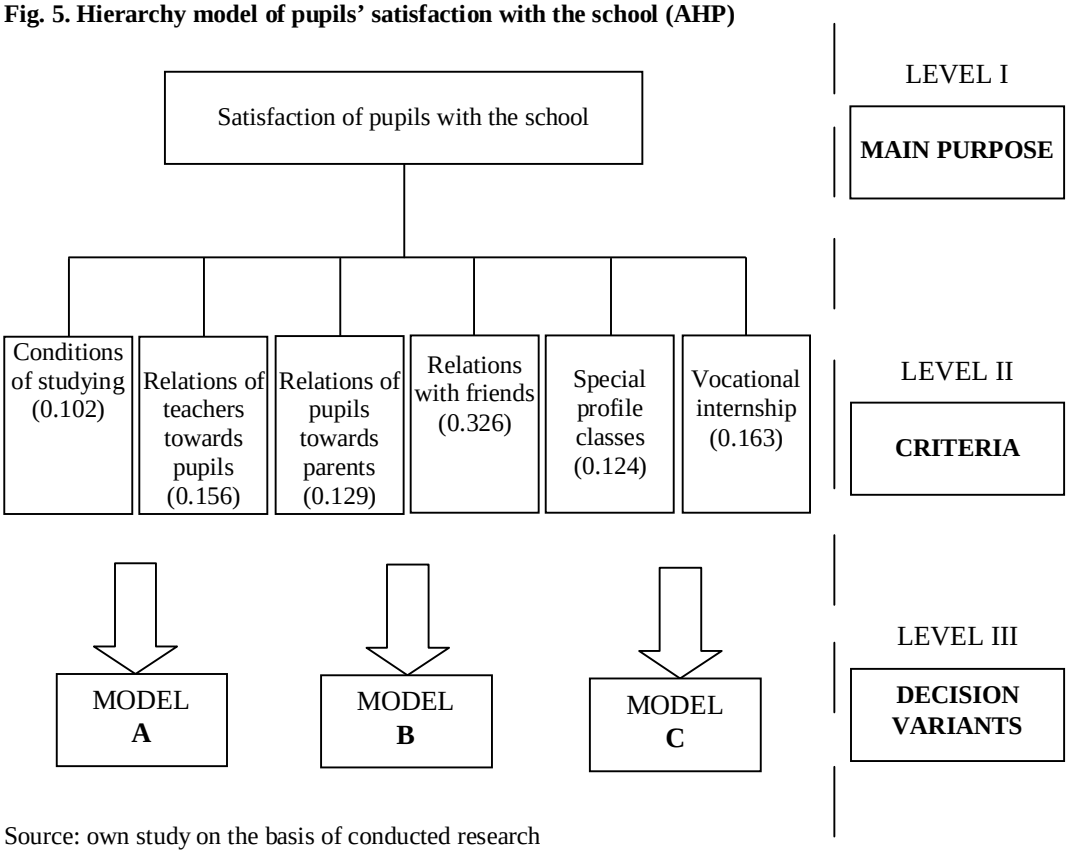
Legend:

1. Remuneration
2. Security of employment
3. Relations with pupils
4. Relations with school principal
5. Relations with parents
6. Possibility of personal development
7. Work environment
8. Participation in school management
9. Vision and mission

Source: own study on the basis of the conducted research

Models of Pupils' Motivators

Fig. 5. Hierarchy model of pupils' satisfaction with the school (AHP)



Source: own study on the basis of conducted research

Selection of optimum motivators of pupils to study at schools is determined by the C motivation model, which has the greatest sum of priorities.

Table 17. Priorities of factors motivating pupils to studying at school

No.	Satisfaction criteria	Model	Priorytet	Model		
				A	B	C
1.	Conditions of studying (0.102)	A	0.090	0.009		
		B	0.455		0.046	
		C	0.455			**0.046**
2.	Relations of teachers towards pupils (0.156)	A	0.108	0.017		
		B	0.789		0.123	
		C	0.103			**0.016**
3.	Relations of pupils towards teachers (0.129)	A	0.143	0.019		
		B	0.143		0.019	
		C	0.714			**0.092**
4.	Relations with friends (0.326)	A	0.467	0.152		
		B	0.066		0.022	
		C	0.467			**0.152**
5.	Special profile classes (0.124)	A	0.455	0.056		
		B	0.090		0.012	
		C	0.455			**0.056**
6.	Vocational internship (0.163)	A	0.184	0.030		
		B	0.753		0.123	
		C	0.063			**0.010**
∑	1.000			0.283	0.345	**0.372**

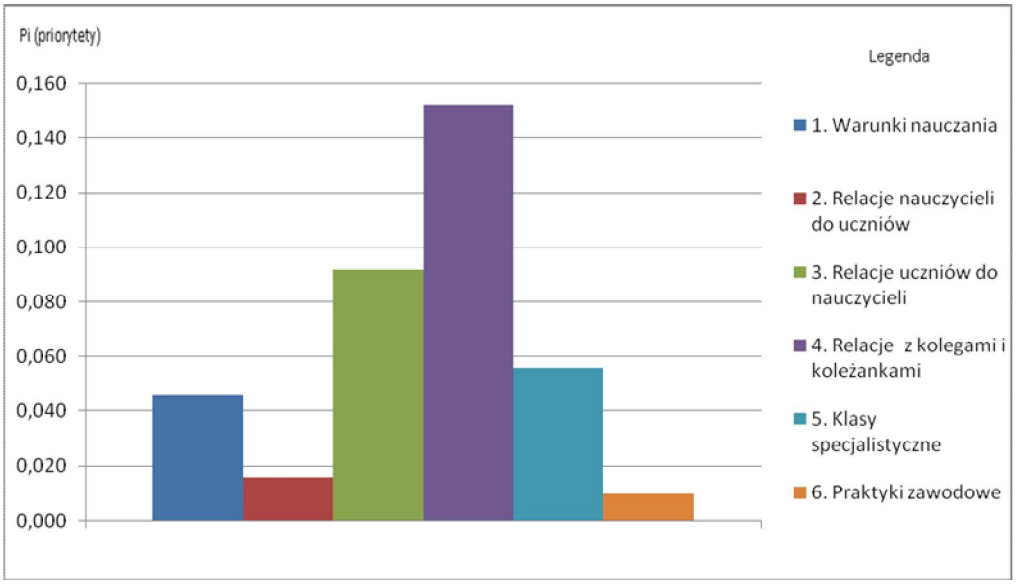
Source: own study on the basis of conducted research

Table 18. Hierarchy of pupils' motivators with respect to studying at school in the optimum model [Model C]

No.	Criterion	Priorities [Pi]
1.	Relations with friends	0.152
2.	Relations of pupils towards teachers	0.092
3.	Special profile classes	0.056
4.	Conditions of studying	0.046
5.	Relations of teachers towards pupils	0.016
6.	Vocational internship	0,010

Source: own study on the basis of conducted research

Fig. 6. Optimum model of pupils' motivators with respect to studying at school (Model C)



Legend:

1. Conditions of studying

2. Relations of teachers towards pupils

3. Relations of pupils towards teachers

4. Relations with friends

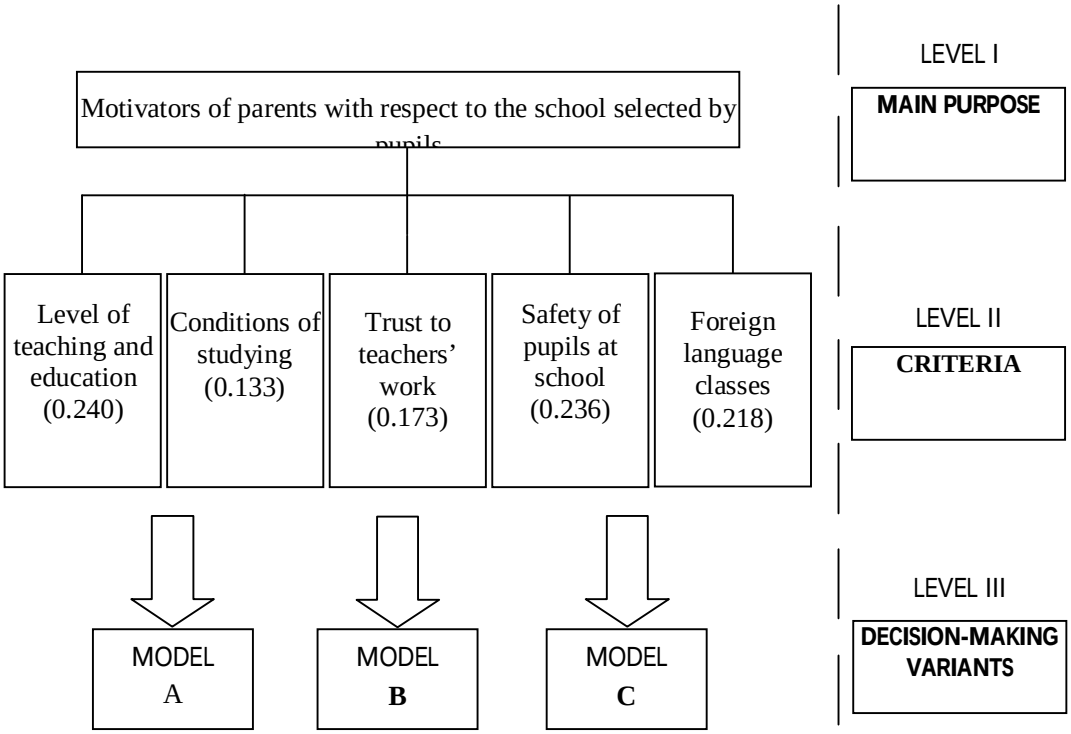
5. Special profile classes

6. Vocational internship

Source: own study on the basis of conducted research

Models of Parents' Motivators

Fig. 7. Hierarchy model of parents' motivators with respect to the school selected by pupils (AHP)



Source: own study on the basis of conducted research

Selection of optimum motivators of parents with respect to the school selected by pupils is determined in the A motivation model which has the greatest sum of global priorities.

Table 21. Parents' motivators with respect to school selected by pupils in a model approach

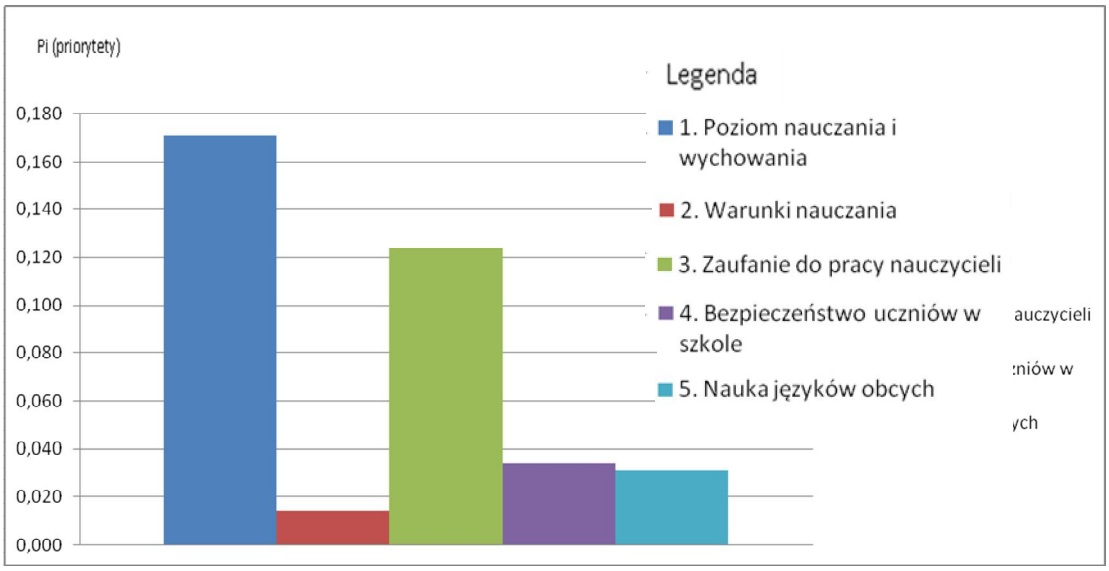
No.	Satisfaction criteria	Model	Pi PRIORITY	Model		
				A	B	C
1.	Level of teaching and education (0.240)	A	0.714	**0.171**		
		B	0.143		0.034	
		C	0.143			0.034
2.	Conditions of studying (0.133)	A	0.111	**0.014**		
		B	0.788		0.105	
		C	0.111			0.014
3.	Trust to teachers' work (0.173)	A	0.714	**0.124**		
		B	0.143		0.025	
		C	0.143			0.025
4.	Safety of pupils at school (0.236)	A	0.143	**0.034**		
		B	0.714		0.169	
		C	0.143			0.034
5.	Foreign language classes (0,218)	A	0,143	**0.031**		
		B	0,143		0.031	
		C	0,714			0.155
∑	1,000			**0.374**	0.364	0.262

Source: own study on the basis of conducted research

Table 20. Hierarchy of parents' motivators with respect to the school selected by pupils in a model approach [Model A]

No.	Criterion	Priority [Pi]
1.	Level of teaching and education	0.171
2.	Trust to teachers' work	0.124
3.	Safety of pupils at school	0.034
4.	Foreign language classes	0.031
5.	Conditions of studying	0.014

Fig. 8. Optimum model of parents' motivators with respect to school selected by pupils (Model A)



Pi (Priority)

Legend

1. Level of teaching and education

2. Conditions of studying

3. Trust to teachers' work

4. Safety of pupils at school

5. Foreign language classes

Source: own study on the basis of conducted research

As a result of the conducted analysis of the hierarchy process in the approach of the AHP method, three alternative variants (models) of motivators were prepared (built) for each examined group. The use of AHP for studies allowed for a comprehensive approach to school management. With the use of AHP, hierarchy of motivators was prepared: of principals, of teachers, of pupils and of parents. The best variant was selected with respect to motivation of directors, teachers, pupils and parents whose implementation and further modification will allow for more efficient management of schools via motivation.

Out of four functions in the work management process, the motivation function was emphasized in particular and referred not only to school principals and teachers, but also to pupils and parents.

The following conclusions with respect to motivators of school principals can be drawn from this study:

– it is necessary to aim at creating conditions conducive to innovation at schools; the school principal should act as a change innovator, applying affective management (identification and motivation) in contacts with teachers and an initiator of shaping their creative stances;

– indication of evaluation of teaching results and innovation on the basis of the optimum model is recommended for the practice of school management; mastering of school principal's skills within the scope of the following motivators: motivating teachers to self-development,

evaluation of teaching results, innovative teaching programmes.

Within the scope of motivators of teachers with respect to work at school, the following conclusions were drawn:

– use of teachers' competences in requalification of teachers threatened with loss of work: which will contribute to increase in the feeling of security;
– rebuilding of the strategy of motivating teachers for the purpose of changing the hierarchy of priority values to motivation compliant with the desired implementation of school objectives.

Within the scope of factors motivating pupils to study at school, the following conclusions were drawn:

– it is necessary to emphasize class management techniques; undertake activities that integrate pupils in a class; direct them towards socially desirable values; create customs of collective actions for achievement of objectives;
– it is necessary to modernize implementation of vocational internship; enable pupils to achieve professional success;
– it is necessary to build expected relations of teachers with pupils on the basis of partner relation to pupils.

Within the scope of motivators of parents regarding the school selected by pupils:

– it is necessary to aim at constant and systematic increase in the level of teaching and education in schools;
– it is necessary to build trust to teachers' work via dialogue, cooperation, diagnosis of needs and expectations of parents with respect to a school and knowledge about the values cherished by them;
– it is necessary to consistently ensure safety for all pupils in schools.

Recommendations within the scope of improved management of upper secondary schools resulting from analysis of obtained study results:

1. The applied AHP method in examination of motivation of school principals, teachers, pupils and parents revealed problems in internal and external motivation with which school principals have to deal during management of upper secondary schools.
2. The conducted analysis of existing motivation mechanisms, on the basis of AHP, allowed for determining the areas of school management and in them important needs of changes within the scope of motivation of principals, teachers, pupils and parents for the purpose of improving management efficiency.
3. According to the studies, when aiming for high efficiency of management, it is necessary to pay special attention to human resources and skills of managerial personnel to whom implementation of visions, missions and purposes of schools belong and its prosperity.
4. Hierarchy presentation of motivators: of school principal within the scope of school management, of teachers with respect to work at school, of pupils with respect to studying, of parents with respect to the school selected by pupils constitutes a reliable source of information within the scope of improvement of management efficiency.

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Acts:

1. Act of **March 19, 1982** Teachers' Chart (Journal of Laws of 2006, No. Nr 97, item 647, Journal of Laws of 2009, No. 56, item 458 as amended).
2. Act of **September 7, 1991** on the educational system (Journal of Laws of 1991, No. 95, item 425, as amended, uniform text: Journal of Laws of 2004, No. 256, item 2572 as amended: Journal of Laws of 2009, No. 56, item 458).
3. Act of **January 8, 1999** introducing reform of educational system (Journal of Laws of 1999, No. 12, item 96, amendments: Journal of Laws of 2000, No. 12, item 136).