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CIVITAS PER POPULI

Obsah

EDITORIAL 3

TEACHING STAFF ORIENTATION IN CZECH SCHOOLS 5

CZECH PRIMARY SCHOOL VISIONS FROM THE PERSPECTIVE OF HUMAN RESOURCE MANAGEMENT 11

RECRUITING HUMAN RESOURCE USING PR COMMUNICATION TOOLS AND SOCIALLY RESPONSIBLE ACTIVITIES 18

MOTIVATION TO WORK FOR EMPLOYEES IN REGIONAL EDUCATION AND POSSIBILITIES TO INFLUENCE IT 25

FUTURE TECH PROGRAM AS A TOOL TO INCREASE COMPETITIVENESS OF INNOVATIVE TECHNOLOGICAL ENTERPRISES IN THE INTERNATIONAL MARKET 32

DATA SCIENCE METHODS IN EVALUATING INNOVATIVE POTENTIAL AND INNOVATIVE ACTIVITY OF INDUSTRIAL ENTERPRISE UNDER CONDITIONS OF DIGITAL ECONOMY 39

EDITORIAL

Papers in this monothematic issue are focused on area of study of development of human capital and management and in different type of organizations – mainly in educational organizations in different contexts of regional development and changes in society 4.0. The main aim of the issue is to describe different point of view in theory and practice of regional development in international context. Papers are based on the results of internal grant projects from The College of Regional Development and Banking Institute, AMBIS, a.s., Opinions on changes in working conditions in enterprises in the period 4.0 (IGA_01_2019) and the long term cooperation with universities in Russia - Moscow Polytechnic University and Technological University, Korolev, Moscow Region and with Mendel University in Brno, Faculty of Business and Economics, educational management Faculty of education, Charles University.

The themes are human resources in regional development, in organisations and enterprises with relationship to regional labour market, approaches of management to human capital, changes in educational structure in regions, in relation to technology changes in fourth industrial revolution. The regional aspect is becoming from Central Europe as Czech Republic and Eastern Europe as Russia.

Renata Skýpalová, Martin Šikýř and Jana Marie Šafránková in paper "Teaching staff orientation in Czech schools" describe the orientation process of teachers based on the authors´ findings of questionnaire survey on human resource management in Czech schools. The survey was conducted during the school year 2018/2019. The respondents were headmasters and deputy headmasters from 84 schools of Czech nursery, primary and secondary schools. The results show that surveyed schools are able to successfully master the teaching staff orientation, however they need to apply a more systematic approach to the orientation process as well as to the human resource management.

Přemysl Doležal and Renata Skýpalová in paper "Czech primary school visions from the perspective of human resource management" describe the authors´ findings of the questionnaire survey of primary schools' visions from the perspective of educators, defining major challenges faced by head teachers. 347 teaching staff of 19 primary schools from two regions of the Czech Republic participated in the survey. The results suggest that teachers expect the school management to stimulate the material development and working climate of the school as well as to raise their motivation and support along with strengthening their competencies.

Renata Skýpalová and Denis Drexler in paper "Recruiting human resource using PR communication tools and socially responsible activities" are concentrated on area of internal communication channels and public relations for the employees of the organization. The paper focuses on the perception of the role of in-house communication and the use of PR tools to strengthen the human capital and mitigate staff turnover. The questionnaire survey administered in various organizations in the two selected regions of the Czech Republic with 164 responses.

Michaela Tureckiová in paper “Motivation to work for employees in regional education and possibilities to influence it“
The study deals with the possibilities of influencing the motivation to work by managers in the segment of regional education. Respondents of a qualitative research survey were managers and employees who currently work in regional education or who are very familiar with the practice of school management. The aim of the survey was to define specific possibilities how to positively influence the motivation to work and thus the work performance of employees in regional education.

Ivan Alexandrovich Zaitsev, Victoria Vadimovna Chukhrina and Lev Dmitrievich Gurtskoy in study “Future tech program as a tool to increase competitiveness of innovative technological enterprises in the international market” describe the program of the state budgetary institution “Moscow Agency of Innovations” Future Tech, which is aimed at supporting innovative technological subjects of small and medium enterprises by solving their urgent business problems by students of Moscow universities, as well as its contribution to improving the competitiveness of innovative technology companies in Moscow in the international market.

A.E. Gorokhova, I.A. Zaitsev and V.D. Sekerin in paper “Data science methods in evaluating innovative potential and innovative activity of industrial enterprise under conditions of digital economy” examines some examples of mathematical methods used in data science to assess the innovative potential and innovative activity of an industrial enterprise in a digital economy for new information, statistical data, as well as to make forecasts and economic proposals, these same methods can be used to work with data when evaluating innovative indicators of an enterprise.

TEACHING STAFF ORIENTATION IN CZECH SCHOOLS

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Keywords:
Czech schools, human resource management, orientation process, teaching staff

Abstract:
A critical point at the beginning of the cooperation between a teacher and the school is the orientation process when the teacher becomes familiar with the conditions and requirements of work at the school. Successful orientation of teachers is the responsibility of headmasters and deputy headmasters involved in managing and leading teachers. The goal of the paper is to present the main findings of the authors' questionnaire survey on human resource management in Czech schools and define the current challenges of headmasters and deputy headmasters of Czech schools in the teaching staff orientation. The survey was conducted during the school year 2018/2019. The respondents were headmasters and deputy headmasters of Czech nursery, primary and secondary schools. The relevant data were obtained from 84 schools. The results show that surveyed schools are able to successfully master the teaching staff orientation, however they need to apply a more systematic approach to the orientation process as well as to the human resource management.

Introduction

Nursery, primary and secondary schools, that provide preschool, primary and secondary education, naturally play an important role in every society. They systematically prepare children and youth for a successful life in the society (Bohlmark, Gronqvist, & Vlachos, 2016). This is very important because well-educated and successful people determine the future prosperity of the society (Laskowska & Danska-Borsiak, 2016). In this context, it is clear that the effectiveness of preschool, primary and secondary education depends on people, especially on teachers whose knowledge, skills, abilities and motivation determine the quality of education in schools.

The teaching staff represents the most valuable source of any school and headmasters or deputy headmasters who want to achieve excellent performance of their schools should pay special attention to management and leadership of their teachers (Litsareva, 2015). To achieve expected performance of schools by achieving desired performance of their teachers, the headmasters and deputy headmasters need an optimal system of human resource management based on proven policies and practices that will enable them to efficiently attract, employ, stabilize and develop enough qualified and motivated teachers (Runhaar, 2017).

The human resource management policies and practices applied in schools should also include policies and practices related to the teaching staff orientation that should help teachers to become familiar with the conditions and requirements of work at the school. The orientation process begins the relationship between teachers and schools. It introduces teachers to their working and social environment. It allows them to learn their tasks, duties and responsibilities

as well as to meet their superiors and colleagues (Kim, Chai, & Park, 2015). By proper orientation, teachers can start being productive quickly. It also reduces teaching staff turnover due to misunderstandings and unfulfilled expectations (Hacker, 2003). Successful orientation of teachers is definitely one of the most important responsibilities of headmasters and deputy headmasters involved in managing and leading teachers to perform agreed work, achieve desired performance and meet expected goals of the school.

1. Goal and method

The goal of the paper is to present the main findings of the authors' questionnaire survey on human resource management in Czech schools and define the current challenges of headmasters and deputy headmasters of Czech schools in the teaching staff orientation.

Achieving the goal of the paper is based on the analysis of available scientific literature on school and human resource management and the results of the authors' questionnaire survey on human resource management in Czech schools.

The survey was conducted during the school year 2018/2019. The questionnaire included 10 multiple choice questions focused on the approach to human resource management and the teaching staff orientation. The respondents were headmasters and deputy headmasters of Czech nursery, primary and secondary schools. The relevant data were obtained from 84 schools, including 21 nursery schools, 43 primary schools, 12 nursery and primary schools, and 8 secondary schools.

The data analysis was based on the calculation of relative frequencies (as a share from the total number of schools) and the evaluation of the dependence of responses on the size of the school in terms of the number of teachers (10 or less, 11-49, 50 or more) using contingency tables and chi-square tests of independence.

2. Results of the authors' questionnaire survey

This chapter presents the main findings of the authors' questionnaire survey focused on the approach to human resource management and the teaching staff orientation in Czech schools.

Both the theory and practice of human resource management show that applied human resource management policies and practices affect the ability of any school to achieve expected school's performance through achieving desired teachers' performance. According to the results of the authors' questionnaire survey, 83% of respondents agreed that they analyse the strengths, weaknesses, opportunities, and threats of their schools, 79% of respondents agreed they define strategic objectives, policies and practices of human resource management in their schools, 83% respondents agreed that they plan the implementation of human resource management policies and practices in their schools, and 86% of respondents agreed that they evaluate the effectiveness of human resource management policies and practices in their schools.

In connection with applied human resource management policies and practices, respondents strongly agreed, agreed, disagreed, or strongly disagreed that applied human resource management policies and practices help them to achieve defined results of human resource management, including necessary number and structure of employees (including teaching and non-teaching staff), required knowledge and skills of employees, expected satisfaction and

motivation of employees, desired results and behaviour of employees, good orientation of employees, acceptable turnover of employees, sufficient number of students, or overall satisfaction of parents and other stakeholders (see Table 1).

Table 1: *Results achieved in schools through human resource management (%)*

	Strongly agreed	Agreed	Disagreed	Strongly disagreed
Necessary number and structure of employees	48	47	4	1
Required knowledge and skills of employees	21	74	4	1
Expected satisfaction and motivation of employees	20	67	11	2
Desired results and behaviour of employees	18	70	7	5
Good orientation of employees	37	58	2	2
Acceptable turnover of employees	40	45	12	20
Sufficient number of students	32	40	21	7
Overall satisfaction of parents and other stakeholders	24	69	6	1

Source: author

When it comes to the question of which of the applied human resource management policies and practices respondents considered most important, they stated employee selection (90%), employee compensation (80%), employee planning, employee evaluation, and employee development (71%), and employee orientation (64%).

In terms of the teaching staff orientation, only 49% of respondents stated that they provide orientation of teachers based on the orientation plan. The data analysis showed no significant difference in responses depending on the size of the school in terms of the number of teachers ($p > 0.05$). We tested the null hypothesis that there is no difference in responses depending on the size of the school in terms of the number of teachers regarding the orientation of teachers based on the orientation plan (see Table 2). Since the test statistics was lower than the critical value, we failed to reject the null hypothesis in favour of the alternative hypothesis. In other words, there was no difference in responses depending on the size of the school in terms of the number of teachers regarding the orientation of teachers based on the orientation plan.

Table 2: *The orientation of teachers based on the orientation plan*

Size of the school	Yes	No	∑
10 or less teachers	9* (9.76)**	11 (10.24)	**20**
11-49 teachers	22 (22.94)	25 (24.06)	**47**
50 or more teachers	10 (8.30)	7 (8.70)	**17**
∑	**41**	**43**	**84**

*observed frequencies (O), ** expected frequencies (E)

H_0: There is no difference in responses depending on the size of the school in terms of the number of teachers regarding the orientation of teachers based on the orientation plan.
H_A: There is a difference in responses depending on the size of the school in terms of the number of teachers regarding the orientation of teachers based on the orientation plan.

Level of significance $\alpha = 0.05$

Chi square statistic $\chi^2 = \sum\left[\frac{(P_{r,c} - E_{r,c})^2}{E_{r,c}}\right] = 0.874$

Degrees of freedom (f): $(r-1)\times(c-1) = 2$

Critical chi-square value $\chi^2_{0,05}(2) = 5.991$

r – the number of rows in the contingency table, c – the number of columns in the contingency table

Source: author

The teaching staff orientation process in surveyed schools commonly takes about one year (58%) and includes the cooperation with experienced teachers (74%), the recommendation of literature (70%), the assignment of an experienced teacher (68%), the observation of classes of experienced teachers (65%), or the involvement of all colleagues (43%). On the other hand, only 11% of respondents stated that teachers are provided with the orientation brochure.

In terms of the leadership of the teaching staff orientation process in surveyed school, only 27% of respondents stated that the orientation of teachers is led by the headmaster. Headteachers usually introduce teachers to the school's strategies and policies. The leadership of the teaching staff orientation process is usually the responsibility of experienced colleagues who are in charge of it.

When it comes to the question of which barriers limit the development of the teaching staff orientation system in their schools, respondents stated excessive paperwork (70%), time-consuming activity (63%), and low budget (36%).

A proper teaching staff orientation process should reduce teaching staff turnover. In terms of the teaching staff turnover in surveyed school over the past year, 36% of respondents stated that it was 0%, 46% of respondents stated that it was up to 10%, and 18% of respondents stated that it was over 10%. The data analysis showed a significant difference in responses depending on the size of the school in terms of the number of teachers ($p < 0.05$). We tested the null hypothesis that there is no difference in responses depending on the size of the school in terms of the number of teachers regarding the teaching staff turnover over the past year (see Table 3). Since the test statistics was higher than the critical value, we rejected the null hypothesis in favour of the alternative hypothesis. In other words, there was a difference in responses depending on the size of the school in terms of the number of teachers regarding the teaching staff turnover over the past year.

Table 3: *The teaching staff turnover over the past year*

Size of the school	**0%**	**Up to 10%**	**Over 10%**	**∑**
10 or less teachers	11* (7.14)**	9 (9.29)	0 (3.57)	**20**
11-49 teachers	17 (16.79)	20 (21.82)	10 (8.39)	**47**
50 or more teachers	2 (6.07)	10 (7.89)	5 (3.04)	**17**
∑	**30**	**39**	**15**	**84**

*observed frequencies (O), ** expected frequencies (E)

H_0: There is no difference in responses depending on the size of the school in terms of the number of teachers regarding the teaching staff turnover over the past year.
H_A: There is a difference in responses depending on the size of the school in terms of the number of teachers regarding the teaching staff turnover over the past year.

Level of significance $\alpha = 0.05$

Chi square statistic $\chi^2 = \sum\left[\frac{(P_{r,c} - E_{r,c})^2}{E_{r,c}}\right] = 10.689$

Degrees of freedom (f): $(r-1)\times(c-1) = 4$

Critical chi-square value $\chi^2_{0,05}(2) = 9.488$

r – the number of rows in the contingency table, c – the number of columns in the contingency table

Source: author

3. Implications and recommendations

The authors' findings compared to findings of other researchers in terms of the approach to human resource management in schools show that the necessity for schools to apply an optimal system of human resource management is increasingly acknowledged (Runhaar, 2017). Schools need to apply proven human resource management policies and practices that will enable them to efficiently attract, employ, stabilize and develop enough qualified and motivated teachers.

The application of human resource management policies and practices in schools should be based on a conceptual and systematic approach, including an analysis of the strengths, weaknesses, opportunities, and threats, a definition of strategic objectives, policies and practices of human resource management, a plan for the implementation of human resource management policies and practices, or an evaluation of human resource management policies and practices (Grencikova & Spankova, 2016). The main task is to create conditions in which employees (including teaching and non-teaching staff) will be striving for high standards of performance and development of their knowledge, skills and abilities (Litsareva, 2015).

The modern concept of human resource management implies that management and leadership of employees to perform agreed work, achieve desired performance and meet expected goals should be a fundamental responsibility of all managers in the organization (Fedorova, 2016). In nursery, primary and secondary schools, there are mainly headmasters who are competent and responsible for managing and leading other employees (including teaching and non-teaching staff) to achieve expected results, especially the expected quality of education (Egic, Tasic, & Sajfert, 2010). However, human resource management should to be the most important activity of all school leaders, including deputy headmasters or head teachers (Brauckmann & Schwarz, 2015).

In terms of the teaching staff orientation, the authors' findings show that surveyed schools are able to successfully master the teaching staff orientation, however they need to apply a more systematic approach to the orientation process. The teaching staff orientation should be based on the orientation plan and it should be led by a direct superior, that is by the headmaster, the deputy headmaster or the head teacher. It should also include the participation of other colleagues and the application of different approaches, such as the coaching or mentoring by an experienced colleague or the observation of classes of experienced teacher.

Conclusion

The authors' questionnaire survey on the approach to human resource management and the teaching staff orientation in Czech nursery, primary and secondary schools showed that surveyed schools are able to efficiently attract, employ, stabilize and develop enough qualified and motivated teachers, however they should apply a more conceptual and systematic approach to the human resource management as well as to the teaching staff orientation.

To master the challenges in the teaching staff orientation, it should be based on the orientation plan, it should be led by a direct superior, and it should include the participation of other colleagues as well as the application of different approaches.

The authors' survey is quite unique by its focus on the approach to human resource management and the teaching staff orientation in Czech schools. Similar surveys are quite rare. The specific focus on Czech school as well as the relatively low number of respondents does not allow

authors to draw general conclusions. However, the current authors' survey results are worth attention from leaders of Czech schools who are responsible for employing people (including teaching and non-teaching staff). The current authors' survey results open up new possibilities for further research in the field of human resource management and dealing with teaching as well as non-teaching staff orientation.

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CZECH PRIMARY SCHOOL VISIONS FROM THE PERSPECTIVE OF HUMAN RESOURCE MANAGEMENT

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school vision, primary school, teaching staff, human resource management

Abstract:
Human capital is an important resource for every school, regardless of its size, organizational structure or type. In order to promote the school's development, motivational leadership needs to make optimal use of the staff's potential. The aim of the paper is to discuss the findings of the 2019 questionnaire survey of primary schools' visions from the perspective of educators, defining major challenges faced by head teachers. 347 teaching staff of 19 primary schools from two regions of the Czech Republic participated in the survey. The results suggest that teachers expect the school management to stimulate the material development and working climate of the school as well as to raise their motivation and support along with strengthening their competencies.

Introduction

The management and development of human capital is a coherent process, as Kucharčíková and Mičiak (2018) point out. Human capital represents the knowledge and skills used by employees performing their work tasks thus pursuing the organization's goals declared in the vision statement to be shared by the management and employees. Such a common vision is motivating for both current and newly recruited staff. In terms of the school environment, Rozkovcová and Urbánek (2017) argue that the longer the teachers work at the same school, the less likely they are to resign, a commonly agreed vision building the teaching staff loyalty. Visionary leadership affects team process and performance since it is positively linked to the staff's creativity (see Zhou et al., 2018).
The key stakeholders – teachers, pupils, students, parents, the general public and the Ministry of Education – place their demands on the school management to guarantee the quality of education provided (cf., e.g. Huang, 2011). A school vision was identified by research done in 27 primary and secondary schools in Alberta, Canada, as an essential precondition for effective school management (Mombourquette and Carmen, 2017).

Effective managerial control and motivation of the teaching staff is a vital part of the daily systematic management of human capital in schools (Runhaar, 2017), involving not just the evaluation of the effects of the internal and external environment, but also establishing strategic goals and visions of how to achieve them (see Grenčíková and Špánková, 2016). Proper management support is required for the staff striving to reach high working standards and the enhancement of their skills and knowledge (cf. Litsareva, 2015).

1. Objective and method

The present article deals with the school development vision from the perspective of pedagogical staff. It aims at defining current challenges for managements at Czech primary schools to share their visions with the staff. The authors' questionnaire survey and available literature on the management of schools and human resources were used. The questionnaire included four questions on expectations regarding vision statements. The survey, conducted in 2019, was attended by 347 teaching staff from 19 primary schools in Olomouc and Zlín regions.

The following two hypotheses were tested:
Hypothesis I.
H0: Employee identification with the current school vision does not depend on the school size (measured by the number of staff).
HA: Employee identification with the current school vision depends on the school size (measured by the number of staff).

Hypothesis II.
H0: Employee willingness to participate in the creation of the school vision does not depend on the school size (measured by the number of staff).
HA: Employee willingness to participate in the creation of the school vision depends on the school size (measured by the number of staff).

The chi-square test of independence was performed to verify the hypotheses, i.e. to check whether the responses depend on the size of the school in terms of the number of teachers (10 or less, 11–40, 41–70, 71 or more). The test compares two-dimensional data summarized in the contingency table, r and s denoting the number of rows and columns, respectively. The following formula is used for the calculation:

$$n_{ij} = \frac{n_{i.} \cdot n_{.j}}{n}$$

By comparing empirical and theoretical tables, the probability of the (in)dependence of variables can be determined. Using the test criterion χ2 and the degree of freedom (r-1) * (s-1),

$$x^2 = \sum_{i=1}^{r} \sum_{j=1}^{s} \frac{\left(n_{ij} - n'_{ij}\right)^2}{n'_{ij}},$$

the tests were carried out at a 5% level of significance.

2. Survey results

This section sums up the outcomes of the questionnaire survey. Recent trends noted in the literature indicate that it is desirable for the school management and staff to cooperate in creating a common vision for the school's further development, full participation in the school's future being an incentive for teachers to continue working at the school. The head teacher should lead their team not only to create but also fulfil the common vision together. In the survey, 219 respondents identified themselves with current visions of their schools, contrary to 128 teachers (i.e. more than a third) who did not comply with them (see Table 1).

Table 1: *Current school vision*

School size	Yes, I identify myself with the current vision.	No, I do not identify myself with the current vision.	∑
10 or less staff	21	53	74
11–40 staff	28	46	75
41 – 70 staff	61	34	95
71 and more staff	77	26	103
∑	**188**	**159**	**347**

Hypothesis I.
H_0: Employee identification with the current school vision does not depend on the school size.
H_A: Employee identification with the current school vision depends on the school size.

Chi-square statistic $x^2 = \sum_{i=1}^{r}\sum_{j=1}^{s}\frac{\left(n_{ij}-n'_{ij}\right)^2}{n'_{ij}} = 11{,}689$

Critical chi-square value $\chi^2 = 9{,}734$ Level of significance $\alpha = 0.05$

Source: authors' own elaboration

The hypothesis of the dependence between employee identification with the current school vision and the school size was also tested, data analysis not revealing a significant difference in responses ($p > 0.05$). The resulting chi-square test value ($\chi 2 = 0.989$) was lower than the critical value (7.347), the null hypothesis (I) thus not being rejected (cf. Table 1).

Respondents were also asked about 15 priority areas related to the current school vision (see Table 2). For each of them, the participants answered whether they were part of their school's contemporary vision. Seven areas were chosen by more than half of the respondents. These are the quality of education (67 %), teaching plans with regard to pupils' interests (67 %), head teacher's leadership (55 %), motivation and support from the school management (57 %), sustainable development of school equipment (67 %), responsibility for school development shared by each staff member (77 %) and continuous school innovation (71 %).

Table 2: *Priority areas included in the current school vision statement (in %)*

Priority	Yes	No
The main priority of the school is quality education	67	33
Teaching plans are provided by the school in line with pupils' interests	67	33
The school's objectives are set with regard to the needs of all stakeholders (parents, pupils, teachers, the public)	31	69
The school strengthens the competencies of teachers	27	73
The head teacher is a leader supporting staff development	55	45
School management motivates and supports the employees	57	43
The school regularly evaluates the fulfilment of its vision and goals	44	56
The school constantly cares about its material development	67	33
Every staff member is responsible for school development	77	23

The school's priorities are decided jointly	47	53
The school is trying to actively involve parents in its endeavours	33	67
The school management tries to foster a good working climate	44	56
The school is constantly driven by the need to innovate	71	29
Staff are willing to devote part of their free time to school	45	55
Teaching plans are designed in cooperation with external experts	11	89

Source: authors' own elaboration

Respondents were also asked about future school visions (see Table 3). They indicated which of the 15 areas they considered important for setting out the school's new vision. More than half of respondents picked five key areas, namely the quality of education (59 %), teachers' skills improvement (51 %), support and motivation of staff (87 %), continuous school equipment upgrade (83 %) and favourable working climate (78 %).

More than a third of educators questioned replied that it was unimportant to take personal responsibility for the school development (39 %), set targets for all stakeholders (32 %) and compile syllabuses with the help of external experts (36 %).

Two areas were identified by around a third of respondents as totally irrelevant to the school's vision, namely the need to devote part of teachers' free time to the school (31 %) and to develop teaching plans in collaboration with outside practitioners (30 %).

Table 3: *Priority areas for future school vision statement (in %)*

	Very important	Important	Unimportant	Completely unimportant
The main priority of the school is quality education	59	34	7	0
Teaching plans are provided by the school in line with pupils' interests	49	23	27	1
The school's objectives are set with regard to the needs of all stakeholders (parents, pupils, teachers, the public)	35	23	32	10
The school strengthens the competencies of teachers	51	21	27	1
The head teacher is a leader supporting staff development	48	47	4	1
The school management motivates and supports the employees	87	11	1	1
The school regularly evaluates the fulfilment of its vision and goals	34	54	9	3
The school constantly cares about its material development	83	13	3	1
Every staff member is responsible for school development	33	27	39	1
The school's priorities are decided jointly	48	47	4	1
The school is trying to actively involve parents in its endeavours	33	47	15	5

The school management tries to foster a good working climate	78	13	6	3
The school is constantly driven by the need to innovate	48	47	4	1
Staff are willing to devote part of their free time to school	21	26	18	31
Teaching plans are designed in cooperation with external experts	23	11	36	30

Source: authors' own elaboration

The last question concerned the teachers' willingness to participate in shaping the future school vision. More than half of the respondents (219) stated that they were willing to take part in the school's vision creation. Data analysis also showed a significant difference in responses relative to the school size according to the number of staff ($p > 0.05$). The resulting chi-square test value ($\chi 2 = 11.689$) was higher than the critical value (9.326), so the null hypothesis (I) was rejected. It can therefore be concluded that the preparedness to engage in the development of the school vision depends on the size of the school (see Table 4).

Table 4: *Willingness to take part in the creation of a school vision*

School size (no. of staff)	Yes, I am willing to participate in creating a school vision	No, I am not willing to participate in creating a school vision	∑
10 or less staff	45	29	74
11–40 staff	46	29	75
41–70 staff	61	34	95
71 and more staff	67	36	103
∑	**219**	**128**	**347**

Hypothesis II.

H_0: Employee willingness to participate in the creation of the school's vision does not depend on the school size.

H_A: Employee willingness to participate in the creation of the school's vision depends on the school size.

Chi-square statistic $x^2 = \sum_{i=1}^{r} \sum_{j=1}^{s} \frac{\left(n_{ij} - n'_{ij}\right)^2}{n'_{ij}} = 11{,}689$

Critical chi-square value $\chi^2 = 9{,}326$ Level of significance $\alpha = 0.05$

Source: authors' own elaboration

3. Implications and recommendations

Research to date has confirmed that human capital is a critical resource for any organization (cf., e.g. Laskowska and Danska-Borsiak, 2016), the line manager bearing responsibility for managing employees to achieve the required performance and meet the set objectives (Kucharčíková and Mičiak, 2018). In the school environment, head teachers and their deputies are in charge of this agenda, creating a vision of the school development being also within their competence. The results of the present survey indicate that teachers are willing to take part in it, their involvement depending on the size of the school. In schools with 41 or more employees, teachers are more committed to being engaged than in schools with fewer teaching staff. The readiness to engage oneself is therefore influenced by the school size. In any case, it is advisable for the management to make use of the declared preparedness of teachers to participate in the development of the vision statement. Within this framework, teachers most often highlight support, motivation and good working atmosphere inspired by the school management. In the staff's view, the vision should also stimulate the boost of their competencies and material development of the school. Only two of these priorities – empowering teachers to become more

competent professionals and working climate improvement are included in current vision statements of the majority of respondents' schools. It is thus worth paying sustained attention to the aforementioned areas since a common sharing of the vision enables the management to develop the school and the teaching staff in the long run.

The teachers were also asked about their satisfaction with the current school vision. More than half of them seem to be happy with it. Having checked whether the size of the teaching staff had an impact on their satisfaction, the dependence was not proven.

Conclusion

The survey of the school vision creation from the perspective of pedagogical staff is quite unique in its focus on the issue of a common vision sharing and its overlap into the sphere of human resources management. The authors undertook a questionnaire survey on a sample of 347 teaching staff at selected primary schools in Olomouc and Zlín regions of the Czech Republic. The results are useful for headmasters and their deputies developing a school vision.

The analysis of the findings suggests that teachers are willing to participate in creating the school vision, especially in schools employing more than 40 staff. As part of a future vision, educators demand that the need for continuous material development, a good working climate, motivational and supportive leadership and strengthening the staff members' competencies be addressed. It is primarily the responsibility of the head teacher as a leader to take these requirements into account and involve teaching staff in crafting the vision statement.

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RECRUITING HUMAN RESOURCE USING PR COMMUNICATION TOOLS AND SOCIALLY RESPONSIBLE ACTIVITIES

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Internal communication, public relations, communication tools, corporate social responsibility, CSR activities

Abstract:
Internal communication channels and public relations are rich sources of the right information for the employees of the organization. Optimal design and use of the internal communication system along with the pursuit of the corporate social responsibility agenda contribute to improving the company's human capital management.

The present paper focuses on the perception of the role of in-house communication and the use of PR tools to strengthen the human capital and mitigate staff turnover. The questionnaire survey administered in various organizations in the two selected regions of the Czech Republic yielded a total of 164 responses, the outcomes allowing to cover the applicability of particular communication tools towards employees and job seekers.

Introduction

An effective human capital management scheme is a significant aspect of running an organization, providing the conditions that encourage the staff to work hard and develop their skills and abilities (see Litsareva, 2015). The achievement of this objective is based primarily on the quality of HR management and company leadership (cf. Fedorova, 2016). Most research to date on the value of human capital shows that people are a critical resource in all organizations (Laskowska and Danska-Borsiak, 2016).

Current labour market situation in the Czech Republic (low unemployment, labour shortages) requires enterprises to enhance the job satisfaction of their employees and to attract new recruits. In this respect, corporate social responsibility (CSR) programmes and PR tools facilitating smooth internal communication are of utmost importance. The use of in-house channels of communication – apart from social networking and emailing – is preferred by Millennials (Generation Y, born between 1980 and 2000) in particular (cf. Legnderová, 2014).

The present paper deals with the various internal communication tools utilized by companies in selected regions of the Czech Republic, allowing them to develop their business and stabilize work teams, increasing job satisfaction of their members. The engagement and retention of

promising employees poses a major challenge for organizations, which is even amplified in a global environment (cf. Aguenza and Som, 2012).

Due attention is also devoted to corporate socially responsible initiatives whose attractiveness for employees – the key stakeholders in the company – is constantly rising. Bagińska (2019) claims that "[e]very enterprise should implement CSR rules in its activity". As Sorensen, Tyson, McKim and Aaron (2014) argue, when choosing an employer, along with the very job offered, candidates consider internal socially responsible activities available. An example of a CSR-related arrangement is a work-life balance sought for especially by Y-generation employees (Legnderová, 2014). To induce their commitment thus stabilizing the employment in a given firm, it is crucial to offer some competence development opportunities and employee benefit schemes (see Naim and Lenka, 2018).

In addition to pay, job characteristics, professional recognition and personal development, socially responsible behaviour is also a significant factor in retaining employees – work-life balance maintenance representing a good example (Aguenza and Som, 2012). Effective means of achieving this balance are flexible work schedules, part-time work or job sharing as Dizaho, Salleh and Abdullah (2017) point out.

Having examined in-house staff relations, Gawke, Gorgievski and Bakker (2018) confirmed the positive correlation between employee engagement and benefits and rewards available. Among the benefits are also socially responsible practices such as corporate volunteering during work hours, job sharing, offering pet-friendly offices or arranging public collections. According to Basil, Runte, Easwaramoorthy and Barr (2009), corporate support for volunteering benefits both employees and the entire organization. The research showed that Canadian companies passively support employee volunteering in a variety of ways such as unpaid leave (71 %) or work schedule adjustment (78 %), these sensitive CSR efforts boosting employee morale.

A study conducted by Kim, H. R., Lee, M., Lee, H. T. and Kim, N. M. (2010) indicates that corporate social responsibility is related to employee-company identification, CSR initiatives strengthening employees' commitment.

Apart from pay, an important role in recruiting and motivating employees is played by the benefits offered. Many enterprises rely primarily on a diverse range of benefits to attract the job seekers. Hitka and Kozubíková (2018) maintain that the main motivation factors include basic salary, job security and a good work team. Workforce motivation, however, is a complex continuous process, managers striving to find the optimal motivational mix for performance-oriented employees (cf. Panait, C. A. and Panait, N. G., 2018)

1. Objective and method

The aim of the paper is to assess the perception of traditional PR communication tools with respect to socially responsible activities as a component of human capital management. The article is part of a broader research project focused on public relations and the corporate social responsibility agenda in Czech companies.

The main survey objective was to determine how different communication channels are applied and assessed in recruiting staff and meeting internal corporate goals. At the same time, the perception of CSR communication within the workplace was investigated.

For the survey purposes, staff of various organizations in selected areas of the Czech Republic, namely the South Moravian and Zlín regions, were randomly addressed. The method adopted for collecting data was an online questionnaire developed and administered using a Google Docs form. The questionnaire was submitted throughout the period between May and July 2019. A total of 164 responses were obtained, 81 from the South Moravian Region and 83 from the Zlín Region, women accounting for 70 % and men for 30 % of all the respondents.

The survey was completed by ordinary employees (64 %), heads of departments (17 %), recruiters (5 %), managing directors and executive officers (10 % and 4 %, respectively). A 54% majority of participants attained secondary education, 39 % had a university or college degree and 7 % acquired higher professional education. 64 % of respondents have been employed in their current job for less than 5 years, 12 % have worked in the company for 5–10 years, 10 % have been employed for 11–15 years, 9 % for 16–20 years and just 5 % for more than 20 years.

Individual responses were filtered by frequency in each region.

2. Questionnaire survey results

2.1. Communication tools and their use

In terms of the communication tools applied, most of the respondents agreed that they did not use the traditional media to reach out to potential employees – regardless of current labour market shortcomings –, the most used communication channels being online advertisements followed by the company's website. It is noteworthy that less common communication instruments utilized for recruitment purposes, namely social networks and intranet, were mostly reported by respondents as equally frequent ones.

A similar ranking is given to individual tools in terms of assessing the effectiveness of recruitment. For many respondents, however, advertising on their own website seems more effective than online campaigning and social networks are considered more powerful than the intranet. In any case, the above four instruments are rated as the most useful ones.

Television and radio advertising, on the other hand, were largely chosen to be the least used and least effective tools, the former being considered as slightly more powerful than the latter.

For the internal communication, respondents mainly use email, followed by the intranet. Other traditional methods of internal information transfer are common business meetings.

Audio recordings, mobile applications and teleconferences are the least used instruments of internal communication for respondents in all regions. Despite being utilized only occasionally, interviews – both individual and group ones – are of considerable importance in in-house communication; contrary to yearbooks, which are also rarely used.

The person who most often performs internal communication is the head of the department in the majority of 102 cases. The second and third are the company's executive director and HR manager, conducting communication in 62 and 52 cases reported, respectively.

The most frequent primary internal communication target chosen 81 times by the employees was fulfilling the requirements of the parent company, allowing to infer that a lot of companies carry out their in-house communication under the direction of an external superior authority.

The second and third most common primary goals are to prevent side effects and disseminate specific strategic information, the two options being selected 68 and 67 times, respectively.

2.2. Socially responsible activities

Corporate social responsibility practices have the potential to be significant competitive advantages for all enterprises, regardless of their size, core business or territorial scope. Particular activities are considered socially responsible if they go beyond legally required standards. They are broken down into three pillars – social, economic and environmental. This paper deals with employee-centred activities, i.e. the social pillar, focusing on the benefits that can be described as socially responsible.

When selecting or changing employers, candidates also compare work climate and the team they are currently working for with a potential new job environment. They often ask for a workplace visit or a short meeting with future fellow workers. Before deciding to take up a job, it is also usual for the candidates to check the policies of a new workplace on social networks by questioning current employees.

The two most commonly enjoyed CSR benefits are flexible working hours and part-time jobs – chosen by 54.3 % and 45.1 % of respondents in the South Moravian Region and 32.4 % and 64 % in the Zlín Region, respectively. In both regions, the third most used and recognized CSR activities are ethical behaviour and a good working atmosphere. Surprisingly, job sharing scored the lowest in both the regions, which may be due to the fact that this activity is not yet widely offered in the Czech Republic. The table below presents a list of the most frequently used CSR benefits.

Table 1: *CSR benefit utilization (in %)*

CSR benefit	South Moravian Region	Zlín Region
Flexible working hours	54,3	32,4
Part-time work	45,1	64,0
Ethical behaviour, good working atmosphere	39,6	47,0
Children's Day in the company	22,0	33,5
Public benefit collections	20,1	22,0
Combating corruption, anti-corruption measures	19,5	35,4
Corporate volunteering during working time	16,5	28,7
Corporate psychologist	14,0	7,9
Compressed working week	9,8	11,6
Dog-friendly office	9,8	8,5
Corporate kindergarten	9,1	10,4

Job sharing	9,1	12,8
None	7,3	4,9
Outplacement	5,5	4,3

Source: authors' own elaboration

Of the total number of respondents, 7.3 % in the South Moravian Region and 4.9 % in the Zlín Region do not reap any socially responsible benefits. In the South Moravian Region, the least used CSR benefits (below 10 %) include a compressed working week, dog-friendly office, corporate nursery school, job sharing and outplacement services. Within the Zlín Region, the least enjoyed advantages are the company psychologist, dog-friendly office and outplacement assistance.

Although CSR benefits are pretty much used – 40.2 % of respondents being aware of their importance –, they do not seem relevant enough when considering job changes. The offer of CSR initiatives is crucial in deciding on the employer change for only 7.3 % of employees, while being meaningless to 52.4 %.

In general, the results of the survey suggest that CSR activities hold a certain attraction, their promotion is justified and can even grab the attention of would-be employees.

Moreover, 63 % of employees surveyed reported that they communicated CSR practices internally when, for example, organizing collections, philanthropic activities or corporate volunteering.

Recommendation

It is apparent that many enterprises do not fully exploit the potential of individual communication tools, ignoring the obvious fact that the most important bearer of information is their very employees. The addressed respondents often do not realize the purpose and effect of in-house communication. Companies are to be therefore encouraged to intensify internal PR and to share information with their staff.

Since many employees recognize neither the specific objectives nor the impact of various forms of communication, executive management should focus primarily on informing their core staff about its intentions and motives. If organizations manage to convince their employees of the rationale behind each phase of the communication process, they will grasp it, engaging in the implementation of the goals set.

Examples are socially responsible activities where the engagement of individual staff members is desirable. Current employees can also make a significant difference in recruiting new staff by word-of-mouth marketing in particular. Investments in various communication tools are wasted if one's own employees are indifferent or even discredit their own business.

Conclusion

164 respondents took part in the survey of the use of internal communication channels for human resources management and in-company PR procedures, encompassing the corporate social responsibility agenda. The results of the questionnaire survey show the usability of communication and motivation tools (CSR benefits in particular) for employees and businesses, which are increasingly faced with labour shortages and high staff turnover.

Many organizations tend to communicate online to reach prospective employees. Candidates then seek out the benefits offered, the most sought for being education allowances.

Corporate social responsibility is considered important by both workforce and organizations, the most commonly used CSR tool being various working time modifications (e.g. flexible working hours). Employees, however, do not perceive CSR benefits as a strong enough incentive to change their employer.

Research still ongoing, the present results do not allow the authors to draw definite conclusions. Essentially, nonetheless, they confirm the findings of previous studies.

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MOTIVATION TO WORK FOR EMPLOYEES IN REGIONAL EDUCATION AND POSSIBILITIES TO INFLUENCE IT

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Abstract:
The study deals with the possibilities of influencing the motivation to work by managers in the segment of regional education. Respondents of a research survey presented in the Introduction of the study were managers and employees who currently work in regional education or who are very familiar with the practice of school management. Theoretically conceived chapter 1 of the study then introduces concepts of motivation as an internal process and as one of the basic activities of managers. The overview also includes the most well-known theories of motivation / job satisfaction. Intention of the survey, the results of which are presented in chapter 2, was to find out which of the selected theories of motivation and job satisfaction respondents know and use in the practice of management and leadership of employees. The aim of the survey was to define specific possibilities how to positively influence the motivation to work and thus the work performance of employees in regional education. Qualitative research was used for the investigation (methods of questioning in oral and written form – recording the results of group discussions).

Introduction (aim and research methods)

The paper deals with definition of a basic approach to motivation as an internal process, which influences both, conscious and unconscious behavior of individuals in different phases and contexts of their lives. However, the relationship between the internal process of motivation and the possibilities to influence it from the outside is particularly important for the issues examined here. Special attention is paid to the application of the best-known theories of motivation in the practice of school managers and managers of school facilities. Research problem is thus the area of motivation for work activities, or effective influence of this process from outside, by the influence of managers.

The aim of the research was firstly to find out which of the best known theories of (work) motivation / job satisfaction as sources of motivation are applied in the practice of regional education. Furthermore, the survey focused on the definition of basic, "golden rules", how in practice effectively and with the desired results use the process-oriented theories of motivation. Motivation theories from this group is generally less well-known, but important for practice (Mikuláštík, 2015). A partial objective of the research was to confirm the above assumption. The basic goal is to determine, through discussion of selected managers of regional education, the determining possibilities of how to positively influence the motivation to work of employees in the segment of regional education.

Qualitative research was used for the research. The basic research questions (RQ) to be answered were the following three:
RQ1: Which of the selected theories of motivation / job satisfaction do the respondents know?
RQ2: In what way do they use known motivation / job satisfaction theories in practice?
RQ3: What are the possibilities of positively influencing the work motivation of employees in regional education, using knowledge of process-oriented motivation theories?

We consider the answer to the third research question to be crucial for the research. The identified possibilities were labelled in the research as "golden rules of work motivation" and their number was limited to a maximum of ten most important for each used theory of work motivation.

Respondents of the survey, which took place in autumn 2019, were mainly managers and employees of schools and school facilities. The group was also complemented by other experts in the area of people management and in school management, who are not currently active in regional education. However, they are prepared for performance of managerial positions within the framework of formal education at university. Thus the choice of respondents in this case was intentional locally and temporally (deliberate selection of a research sample), precisely because of their own experience with leading people in regional education and of their knowledge in the issue of work motivation. The research sample consisted of 41 respondents. Given the methodology used, the results of the survey will not be statistically evaluated and generalized.

1. Motivation of human behavior and possibilities of its influence in the working process[1]

Concepts of motives and motivation are of utmost importance for analyzing the behavior of people in work organizations. Indeed, when we consider why people behave in the way as they do in certain situations, we must necessarily address the motives of their actions (Nakonečný, 2005; Bedrnová, Jarošová, Nový et al., 2012).

This internal process manifests itself outwardly in behavior, which we then refer to as instrumental (motivation-based) action. For completeness it is necessary to add that the very existence of need is not enough to start action. In addition to awareness of need, other “triggers” are subjectively perceived likelihood of fulfillment and the value of the goal to be achieved, and consideration of the consequences that behavior will have for individuals (ibid and following text of this paper).

All the best known and also in practice of management of educational organization probably used theories of motivation can basically be divided into two groups:

a) motivation theories defining types and structure (usually hierarchized) of needs - such as Maslow's hierarchy of needs, Herzberg's two-factor theory, Alderfer's ERG theory or McClelland's need theory,
b) motivation theories aimed at analyzing and describing the motivation process - for example, Vroom's expectancy theory, Adams's equity theory, Locke's and Latham's goal setting theory.

[1] A text of this chapter is based also on previously published texts by the author.

Some authors (eg Armstrong and Taylor, 2015) cite "instrumental theory" as a separate category of work motivation based on financial / material motivation. Traditionally, it belongs to theories derived from classical theories of organization (scientific management). Its application in the practice of regional education is certainly possible, but financial motivation is generally considered less effective and in terms of remuneration of employees in educational institutions in the segment of regional education also less applicable.

Therefore, if we continue to work with the above two groups of motivation (focus on structure and motivation process) as a starting point to explore the possibilities for influencing the motivation and behavior of employees in regional education, we can further state that the above given theories of motivation can also explain motivation to work. Knowledge of the so-called performance motivation, which is determined as a ratio between the need to achieve success and the need to avoid failure (Heckhausen, in Bedrnová, Jarošová, Nový et al., 2012), is also used to improve overall work performance.

The concept of motivation can also explain the different results (performance) of employees with comparable abilities and the same external conditions created for their performance by organizations (organizational and working conditions). In this context, the question of possible influencing of internal (intrapsychic) needs (and other motives) and the process of external motivation comes to the fore. These external processes are also known as motivating and stimulating and form the essence of people management and leadership. This is also confirmed by Hersey, Blanchard and Johnson (1996). According to them, motivating is a basic managerial function (role). In their publication, they cite research conducted by W. James of Harvard University, which showed that highly motivated individuals use their skills to 80-90%, while others are only using 20-30% of their skills to maintain their work (the possibility of comparison with the known Pareto principle is obvious here - note MT).

It can be stated that the essence of motivating is an effective influence on the motives of the members of the organization (stimulation of motives). For such an externally acting stimulus, the term motivator has come to be known. In theory, the incentives sometimes differ (Nakonečný, 2005). These act on motives indirectly, for example money as a means of satisfying other needs at the physiological and social level. In this case we are also talking about external (extrinsic) motivation. This is considered less effective than intrinsic motivation. However, it also has a place in effective motivation to work and managers must learn to use such incentives in their management activities (Bedrnová, Jarošová, Nový et al., 2012).

Each executive / manager and other decision-makers can thus influence the motives and motivation of other members of an organization, either “intuitively” (“the art of leading people”) or with an extension of knowledge and understanding of theories that further lead to the development of psycho-social leadership skills of managers. In the process of motivating others it is possible to use various management tools based on the application of motivation theories. The purpose is to achieve changes in the behavior of individuals, which will also lead to the development of their competences and improve quantity and quality of the expected performance.

Theories of Organizational behavior and/or Managerial psychology offer some of its own concepts derived from motivation theories (see Table 1). The transformation of theoretical knowledge of motives, motivation and motivating into management practice is then the basis of successful management and leadership of people at the level of individuals, teams and whole educational organizations.

Table 1: *Application of mativation and job satisfaction theories in practice - motivating tools*

MOTIVATION / JOB SATISFACTION THEORY	APPLICATION IN PEOPLE MANAGEMENT
Locke's and Latham's goal setting theory Herzberg's two-factor theory	• Management by Objectivs (MbO) • Performance Management System and cycle (PMC)
Herzberg's two-factor theory	• Programs of Quality of Working Life (QWL) • Work-Life Balance/Integration (WLB/I) programs
Maslow's hierarchy of needs Alderfer's ERG theory McClelland's need theory Adams's equity theory Vroom's expectancy theory	• Recognition and remuneration programs (People Acknowledgement Programs - PAP) • Performance Management System and cycle (PMC) • Competence-based Management (CBM) • Organization development programs • Benefits and motivation programs
Herzberg's two-factor theory Locke's and Latham's goal setting theory	• Participative management and leadership • Quality cycles (QC) • Quality management (TGM / EFQM) • ESOP program

Source: Tureckiová (2009) - edited

The phenomenon of job satisfaction is also closely related to the topic of (work) motivation, as can be seen also from the previous table. Job satisfaction is seen as an important indicator of work motivation and work and social climate of each organization. As such, job satisfaction is also an expression of a working attitude. It has been and is being studied by various authors (for example Štikar, Rymeš, Riegel, and Hoskovec, 2003). Internationally, F. Herzberg is one of the most well-known authors, whose two-factor theory, also included here as a motivational theory, is essentially a theory examining factors of job satisfaction (satisfactors / motivators) and factors that serve to prevent work dissatisfaction (dissatisfactors / hygiene factors).

2. Data collection and research results

The most well-known and already mentioned theories of motivation / job satisfaction have been included in the list (see Table 2). In the first phase of the research, the informants were asked, which of the selected (listed) theories of motivation / job satisfaction they know (RQ1), and to further comment on how to use these theories in practice (RQ2).

Table 2: *List of motivation / job satisfaction theories*

THEORIES FOCUSING TO THE STRUCTURE OF NEEDS	PROCES FOCUSED THEORIES
• Maslow's hierarchy of needs • Herzberg's two-factor theory • Alderfer's ERG theory • McClelland's need theory	• Adams's equity theory • Vroom's expectancy theory • Locke's and Latham's goal setting theory

Source: own professing

Outputs from this phase of the survey confirmed the generally shared assumption that the Maslow's theory (hierarchy of needs) is the most well-known theory of motivation also among managers of regional education (survey respondents). In response to RQ1 (*Which of the selected theories of motivation / job satisfaction do the respondents know?*) respondents also mentioned Herzberg's two-factor theory and general knowledge of the need to set "SMART goals". Respondents have combined this managerial technique with the goal setting theory, which, however, they do not know, and just assume that it is *"SMART related"*. Research at this rather indicative phase of survey later revealed that respondents also had a general idea of Alderfer's theory as a *"simplified pyramid of needs"*.

In the next part of the survey, which was conducted in a combination of moderated discussion and group work with outputs to a broader discussion, the answer to RQ2 (*In what way do they /respondents/ use known motivation / job satisfaction theories in practice?*) was also found. In terms of practical application, respondents referred exclusively to the *"Maslow's pyramid"*. In their opinion, this only theory is consciously used to positively influence the work motivation of employees in regional education; *"to improve the work performance"* of pedagogical and non-pedagogical staff in schools. Respondents also commented on the need for internal motivation of employees in regional education, where *"it is not possible to rely on financial motivation"*. They positively evaluated the possibility of arguing *"job security that is relatively high in educational organizations", "there is a good working environment"* that the manager can appropriately support.

Individual respondents also stated that *"from the grant projects it is possible to obtain interesting aids and other resources that support modern teaching"*. The most important thing, however, is *"anyway internal motivation ... and the need for self-realization"* through pedagogical work and work for and with children. At the same time, the participants of the research are aware that internal motivation should be supported by *"good climate, joint activities of staff - pedagogical and non-pedagogical"*, support of extraordinary achievements by rewards, *"depending on what one sees as praise"*.

In the next phase of the research, attention was focused on the possible use of motivation theories, which are focused on the process of motivation to work. According to the respondents' answers, their currently conscious use of these theories can be considered very low. Therefore, respondents in this section of the survey were first provided information on individual selected theories of work motivation (for an overview - see Table 2 above).

Respondents were further divided into three groups with the following assignments:

a) to add knowledge to the determined theory of work motivation,
b) to recall what procedures they use / know from the practice of school management to positively influence the motivation to work,
c) to choose from such procedures those that can be connected with the given theory of work motivation,
d) to create an overview of basic "golden rules" of the use of the theory of work motivation in practice of regional education.

Through group work, respondents were able to obtain partial answers to RQ3 (*What are the possibilities of positively influencing the work motivation of employees in regional education, using knowledge of process-oriented motivation theories?*). Each group of respondents worked with one of a given process-oriented work motivation theory. The process of fulfilling the

assigned task at all points was recorded by each group and subsequently presented (partly with the possibility of direct or mediated feedback also from other groups).

The outputs of this part of the research are then sets of three groups of "golden rules" for the use of selected theories of work motivation focused on the motivation process. Therefore, in this part of the research were added suggestions how to positively influence the work motivation of employees in regional education. The results of the group work are presented in the following text without any significant modifications and/or comments:

The list of "golden rules" for the effective use of Adams's equity theory consisted of the following seven points:

- *"Transparent and simple workload*
- *Clearly defined competences of employees*
- *Clear placement of employee / group of employees in the organization chart*
- *Pre-defined and unambiguous remuneration criteria*
- *Clearly defined career path options*
- *Precise internal rules on information flow within the organization*
- *Equal workplace conditions".*

The list of "golden rules" for effective use of Vroom's expectancy theory consists of the following five points:

- *"Set a reasonable / achievable task for each employee*
- *To convince him/her that the task is attainable / achievable*
- *Gain employee confidence*
- *Assure him/her that the task will be rewarded*
- *Thoroughly identify employee's preferences and needs".*

The list of "golden rules" for effective use of Locke's and Latham's goal setting theory was made up of the following nine points:

- *"Learn how to SMART goals*
- *Prepare SMART aims as needed by the school*
- *Prepare SMART goals according to the employees' interest*
- *Prepare SMART goals according to the competence of each employee*
- *Set goals together in an interview (manager and each employee)*
- *Set a maximum of three goals per person and agreed time*
- *Focus on non-financial remuneration in meeting the aims/goals*
- *Establish remuneration criteria*
- *Do not forget to evaluate the fulfillment of the goals and give the feedback to employees".*

Conclusion

The aim of the survey, the methodology and results of which are presented in the paper, was to define specific possibilities of how to positively influence the motivation to work and thus the work performance of employees in regional education. The survey confirmed that Maslow's hierarchy of needs is - at least among the respondents of the survey - the most well-known and used theory of motivation. Respondents also know other theories of motivation focused on the structure of needs, but their use does not differ from the application of Maslow's theory. The

survey has also confirmed the assumption that theories of work motivation focused on the process of motivation are generally less well-known, but important for practice.
In the course of the survey respondents learned more about three selected theories of motivation, which are focused on the motivation process. Respondents then created three lists of "golden rules" for the use of those theories of work motivation in the practice of school management / in regional education organizations. Creating of these lists of "golden rules" of motivating of employees in regional education supported not only the learning process of the respondents of the survey (in the steps of evocation - awareness of meaning - reflection) but also their critical thinking. At the same time, their suggestions as to how to reinforce motivation to work can also be used for the development of school management theory and as input data for further research.

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FUTURE TECH PROGRAM AS A TOOL TO INCREASE COMPETITIVENESS OF INNOVATIVE TECHNOLOGICAL ENTERPRISES IN THE INTERNATIONAL MARKET

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Keywords:
government program, innovative enterprises, technological enterprises, the international market, increasing competitiveness, Future Tech, Moscow Government

Abstract:
The article discusses the program of the state budgetary institution "Moscow Agency of Innovations" Future Tech, which is aimed at supporting innovative technological subjects of small and medium enterprises by solving their urgent business problems by students of Moscow universities, as well as its contribution to improving the competitiveness of innovative technology companies in Moscow in the international market.
The article briefly reviews the market for small and medium-sized enterprises, indicates the share of innovative companies. The market needs and requests of technology companies are considered. Examples of innovative companies, partners and program participants are given, as well as an example of business cases that companies provide for solutions within the Future Tech program.

Introduction

In 2020, the Russian economy is rapidly transitioning to a digital model of functioning, which primarily implies the widespread introduction of digital technologies. The economy of Moscow can be called digital, there is a lot of evidence for this, one of which is the PGU portal.mos, a traffic control application, the Department of information technology, which controls the state digital technology network, the traffic control center, and more.

According to the degree of digitalization, Moscow can be compared with the leading European capitals. According to the UN rating, Moscow has become the leader of cities in digitalization, in 2020 Moscow took the first place among Russian cities in the smart city category. Among European capitals, Moscow can compete with cities such as Barcelona, London, Paris and Prague. Moscow can be compared to Tokyo in terms of the development of metro digitalization. (News about Moscow's leadership in the rating of smart cities), (News about Moscow's leadership in the UN rating on digitalization)

In the context of the digital economy, there is a need to develop innovative infrastructure within the city, including citizens, businesses, and city authorities, as only with the development of a common innovation space, rapid overall development of the economy and all its participants is possible. (Gladkiy, Zaitsev, 2019, pp. 178–182), (Pershina ed al., 2019, pp. 610-612)
Innovations ensure sustainable development of the region, participants in relations, and social strata, as well as economic security depends on innovations.

Moscow's innovative potential is growing every year, its innovation activity is at a fairly high level, and the city is actively developing its innovative infrastructure even in the face of sanctions and geopolitical instability. Moscow has 2,298 innovation infrastructure facilities, 36 technology parks, 59 centers for youth innovative creativity, and 17 development institutes. (Zaitsev ed al., 2019, pp. 178-182)

Understanding the need for cooperation, participants in economic activities create associations in the form of innovation clusters, as well as joint programs. When making a strategic decision about the further development of the enterprise, management increasingly pays attention to government programs. (Sikyr ed al., 2018, pp. 248 - 263)

1. Goal and method

The article discusses the program of the state budgetary institution “Moscow Agency of Innovations” Future Tech, which is aimed at supporting innovative technological subjects of small and medium enterprises by solving their urgent business problems by students of Moscow universities, as well as its contribution to improving the competitiveness of innovative technology companies in Moscow in the international market.

The article briefly reviews the market for small and medium-sized enterprises, indicates the share of innovative companies. The market needs and requests of technology companies are considered. Examples of innovative companies, partners and program participants are given, as well as an example of business cases that companies provide for solutions within the Future Tech program.

2. Results

The Moscow government follows the global trend of cooperation between the city authorities, business and scientific institutions and creates a number of programs aimed at developing innovative technology businesses in the city. In 2018, the Department of entrepreneurship and innovative development of Moscow was established, the subordinate institution of which is the Moscow innovation Agency. The purpose of this state institution is to develop innovations in the city. The innovation Agency brings together business structures, the city and technology companies to make Moscow the world's innovation capital. The Agency helps technology businesses Refine and bring innovative products to new markets. ((Moscow innovation Agency)

In Moscow, there are more than 20,000 technological small and medium-sized enterprises(SMEs), of which more than 50% have a shortage of competent personnel, 40% need to develop competencies to solve current business problems (Fig. 1).

Figure 1: *Problems of technological small and medium enterprises in Moscow*

Source: Analytical data of the state budget of the Moscow innovation Agency.

Enterprises experience a number of difficulties when entering the market. according to surveys , one of the main difficulties is recruitment (Table 1).

Table 1: *Difficulties faced by the company when entering the market*

Excessive requirements for the salary	50%
Specialists with the right competencies like stability	45%
The reare not enough specialists in the market with the right specialists	45%
It is not possible to pay a dequate money	33%
They don 't know where to find employees with the right specialists	13%

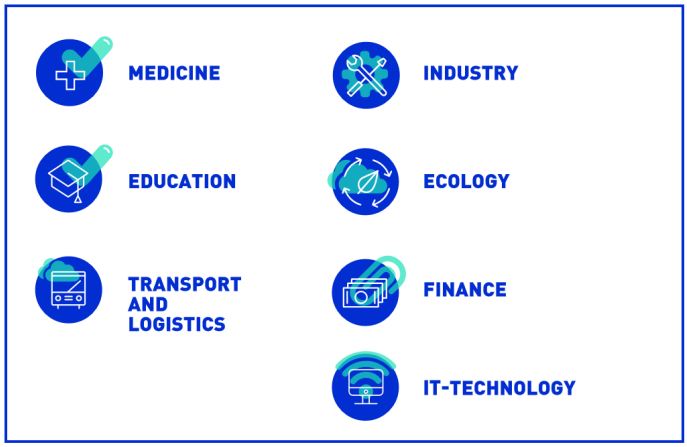
Source: Analytical data of the state budget of the Moscow Agency of Innovations.

Based on the presented statistics, we can conclude that Moscow innovative companies lack resources to enter the international market. Enterprises have an acute problem of lack of personnel, or rather lack of ways to solve problems, since the final goal is to solve the problem, and the staff is a tool to achieve the final goal. Due to this problem, companies are not competitive enough in the international market. (Sekerin ed al., 2018, pp. 165)

The Future Tech program, implemented by the Moscow innovation Agency, is a tool for increasing the competitiveness of innovative technology companies in the global market. The program solves the problems of technology companies through young people, i.e. students of

Moscow universities and graduates. Companies in 7 different areas can participate in the project (Fig. 2). Future Tech program)

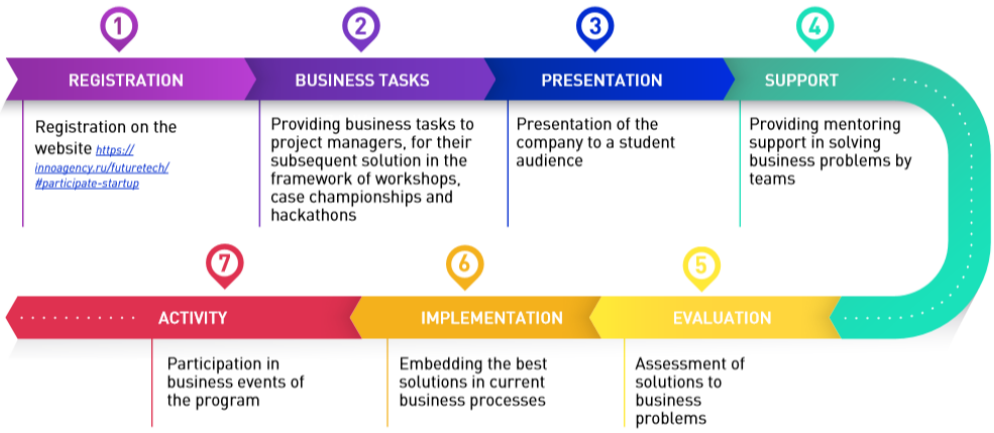
Figure 2: *Tracks of the Future Tech program*



Source: Compiled by the authors.

Future Tech allows you to solve the company's business problems with the help of students participating in the program, get non-standard solutions for business, test your own technologies and hypotheses, get access to a large audience of young professionals and their new ideas, form an innovative brand, and get PR promotion.
The company's path in the Future Tech program is shown in figure 3 (Fig. 3)

Figure 3: *Chain of company actions in the Future Tech program*



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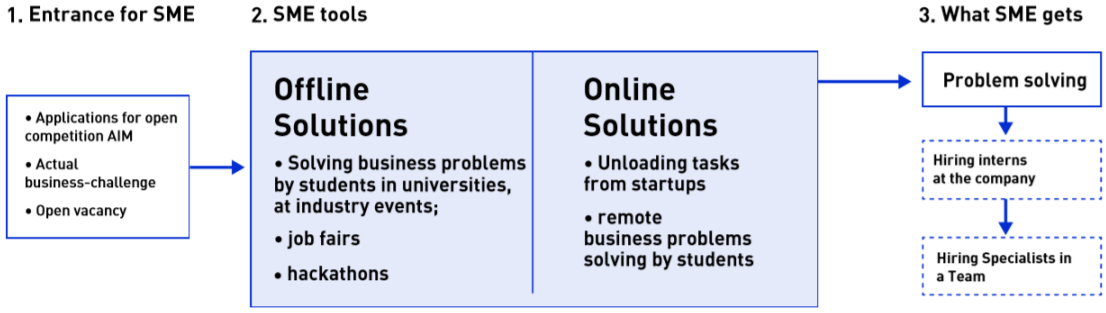
At the same time, various tools are used to achieve the ultimate goal of solving a business problem (Fig. 4)

Figure 4: *Tools of the Future Tech program*



Source: Compiled by the authors.

3. Implications and recommendations

The program is implemented in two directions – online and offline. Here is an example of an algorithm for conducting a case championship. The case-championship consists of a correspondence and full-time stage. The correspondence stage is held for 2 weeks, and the full-time stage is a pitch session, during which students will present their decision to the expert Commission.

1. Students who want to participate in the case championship are registered on the website https://innoagency.ru/futuretechjob/#participate

2. Registered participants are grouped into teams of 4 to 7 people (or with the help of the University)

3. Students receive 25-30 case studies with additional information if necessary (there may be several teams for each task)

4. From all the solutions, the TOP of the best ones are selected, who participate in the face-to-face defense before the expert Commission

The task of the participants is to analyze the situation in 2 weeks, understand the essence of the problem and present solutions. Future Tech provides an organizational mentor and assigns mentors from startups so that participants can ask questions that interest them.

These solutions will be evaluated by representatives of the University, founders of startups, representatives of aim, experts from partners.

Based on the results of full-time defense, the best students can complete an internship at a startup, participate in an Intercollegiate case championship and hackathons.

Here is an example of a case from «Visionary» company. Visionary was founded in early 2019 as a manufacturer of solutions in the field of renewable and digital energy. Since February 2019,

the company has been developing Visionary Power Module-a smart energy storage device to reduce the cost of upgrading and maintaining networks in large cities and remote areas. Visionary plans international expansion and studies the global market for point-of-entry into specific regions and segments. Now the company is looking at opportunities to enter the markets of the United States, Africa (North Africa, Nigeria, South Africa), the Arab region, India. The company has given the following tasks to solve for each of the proposed new markets:

1. Determine the total market capacity of energy storage systems and energy management systems.
2. What companies represent these markets?
For example, one of the major players in the energy management system market in the United States is Schnieder Electric. At the same time, a big player in the US electricity storage market is Tesla (Power Pack).
3. Find examples of projects implemented using the company's products from Clause 2
4. Determine the cost of projects or the cost of equipment and work (for example, request a tap)
5. Make a list of energy companies (power generating and grid companies), mobile phone tower operators, oil and gas producing companies

Conclusion

Within the framework of the Future Tech program, participants will solve the tasks set, thereby ensuring the competitiveness of the innovative company in new markets. Moreover, the solutions are provided to the company free of charge as part of the program for the development of innovative entrepreneurship in Moscow. The company will not have to spend money on an expensive specialist to solve one specific task, which also saves money.

Students get practical experience in solving real business problems, develop their competencies, and receive confirmation of their competencies from an existing company in the form of a certificate, thank-you letter, or recommendation letter in their portfolio. Also, able students get the opportunity to get a job in a company or take an internship there, which will undoubtedly have a positive impact on their career path.

The Future Tech program ensures the competitiveness of Moscow's innovative technology enterprises in the international market, as well as develops students ' applied skills in solving business problems.

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DATA SCIENCE METHODS IN EVALUATING INNOVATIVE POTENTIAL AND INNOVATIVE ACTIVITY OF INDUSTRIAL ENTERPRISE UNDER CONDITIONS OF DIGITAL ECONOMY

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Keywords:
Data science, innovative potential, innovative activity, industrial enterprise, digital economy.

Abstract:
The article examines some examples of mathematical methods used in data science to assess the innovative potential and innovative activity of an industrial enterprise in a digital economy. Since the science of data (data science) has a fairly wide mathematical apparatus, which is designed to search for new information, statistical data, as well as to make forecasts and economic proposals, these same methods can be used to work with data when evaluating innovative indicators of an enterprise.

Introduction

In the digital economy, one of the key factors in the development of an industrial enterprise is the availability of information and skills to work with it. Having information as a resource provides a competitive advantage for the company. Based on this advantage, you can develop a strategy for innovative development of the enterprise, as well as develop innovations themselves. In other words, the information resource provides the innovative potential and innovative activity of the enterprise. (Gorokhova ed al., 2018, pp. 103-108).

Data science is the science that studies the problems of analyzing, processing and presenting data in digital form. Using the methods of data science, you can find almost any necessary information to assess the market and economic prospects of innovation, evaluate the preferences of a potential client, which provides a reliable innovative potential for the enterprise.

To assess the innovative potential and innovative activity of an enterprise, a large amount of data must be collected and analyzed. The collected data must be calculated using mathematical methods to obtain the final value of the innovative potential and innovative activity.

1. Goal and method

This article examines similar methods and tools used in data science to assess the innovative potential and innovative activity of an industrial enterprise in the digital economy.

Big Data technology can be used to develop methods for evaluating the innovation activity and innovative potential of an industrial enterprise. The first step in the assessment should be to collect indicators of the characteristics of innovation potential and innovation activity.

2. Results

A total of i indicators are collected, which are divided into j groups. Indicators can be expressed as an integer (the number of employees involved in R & d), a fraction (average salary of employee engaged in R & d in RUB thousand), shares (share of employees with higher education), percent (percentage of R & d expenditure of the total cost of the enterprise).

Big Data technology allows you to automatically upload, store and process indicators every day and without human intervention. The technology is characterized by 3 V (Velocity, Volume, Variety), which indicates that it is able to work quickly with a large volume of heterogeneous data (Morrison et al.,2010)

In this way, an operator who wants to assess the potential or activity of an enterprise at the moment can get information instantly, without making calculations themselves, without understanding the indicators. This is provided by constant work with Big data. When performing an operation, specialists immediately enter data in Big data, which stores data in the desired district There are also calculation programs that read data every day, such as the number of goods sold or units produced, automatically enter and update information in the company's file system and generate a report. The system collects data in such a way that it immediately distributes data into subgroups, which will form a subindex in the future. Information can be collected in these ways. (Schoenberger, Kukier, 2014, 240 p.)

In order to be able to evaluate innovation potential and innovation activity separately, each criterion in the database corresponds to the values (A) or (P), which means innovation activity and innovation potential. In accordance with the fact that we need to evaluate (innovation activity or innovation potential), big data issues only those criteria that we need to calculate. You can implement this using the simplest logical function "if".

For example:
If: x = " innovation activity»
That:
If: zij=...(A)
To: Nij=zij
…
…
Where,

X-value of the query: innovation, innovation activity, innovation potential
Zij – the value of the parameter
Nij - value of the array of parameters to output.

This function can be implemented using a similar logical condition written in a computer language. In other words, initially only the data requested by the operator is received for further processing. This saves time and data processing resources. (Borovikov, 2003, 688 p.)

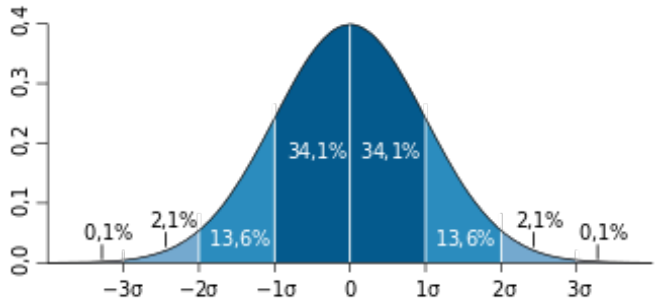
Thus, Big data technology greatly facilitates working with data, and also makes it much more efficient and accessible. Data storage becomes more reliable and long-term. Data does not require physical storage, which reduces storage costs and reduces costs. The most important advantage is that the result can be seen at any time. Indicators can be automatically processed as they are received in the storage, which will speed up the operator's work and allow you to display the final result faster on the screen.

The values of indicators, i.e. big data, are written in different formats: absolute, such as, for example, the number of Universities, relative, such as, for example, the percentage of people with higher education among employees. In order to compare them, the data should be reduced to a single form using mathematical methods.

In Economics, the three Sigma rule is used to set the data sampling frame. All values of indicators of innovation potential and innovation activity should be in the range of three Sigma (formula 1). The probability distribution of finding a number within three Sigma is shown in the figure (Fig. 1), where the mark zero corresponds to the mathematical expectation (Ivchenko, Medvedev, 2010).

Figure 1: *probability Distribution of finding a random variable within 3.*

$$x_i \in (\bar{x} - 3\sigma; \bar{x} + 3\sigma) \quad (1)$$



Source: Compiled by the authors.

If the values go beyond 3 σ, the method of taking the root of degree s is used to reduce them. The degree of the root depends on the coefficient of asymmetry.
The coefficient of asymmetry is equal to the partial of the third Central moment and the standard deviation, raised to a cube (formula 2).

$$\gamma_1 = \frac{\mu_3}{\sigma^3} \quad (2)$$

Where,
γ_1 – Skewness
μ_3 – the third Central moment
σ - the standard deviation

If even after the transformation, the value goes beyond three Sigma, then it does not participate in the calculations, we get rid of it.

The disadvantage of this method is a large level of filtered values, which negatively affects the objectivity of the final value. One of the obvious drawbacks of this method is the case when the values are equal to one. A root of any degree will give one, when extracted from one. That is, in this case, it is impossible to bring the indicator to the frame and it remains only to throw it out.
Correlation analysis can be used to describe the relationship between the characteristics of innovative potential and innovative activity of an industrial enterprise. To take into account the degree of influence of each indicator, determine their relationship to each other, and filter out indicators that do not affect the number of innovations implemented, you can use correlation analysis.
Correlation analysis is a method for processing statistical data based on the study of correlation coefficients. To determine the correlation, we need several observations of the same variable (Kolemaev, 2006).

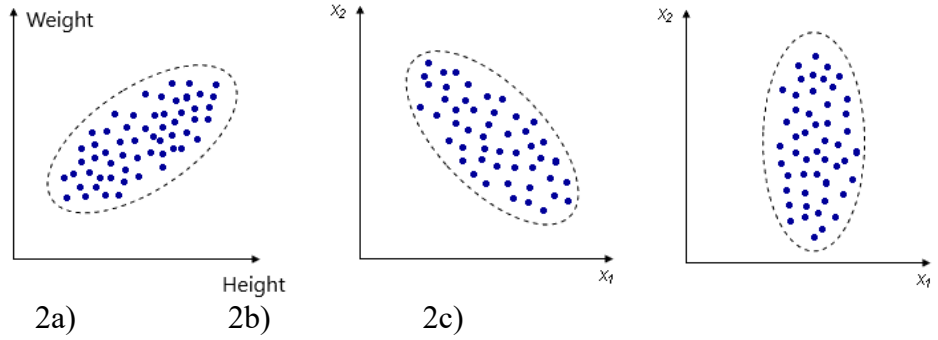
The correlation method allows you to determine: a) whether there is a relationship between the parameters b) what kind and strength of this relationship C) allows you to predict the behavior of one parameter based on data about the second parameter d) helps to classify objects by feature.

The advantages of the method are that the coefficients are quite simple to calculate, and no special mathematical training is required. The interpretation is also quite simple.

The disadvantage is that the method shows only a statistical relationship, not a cause-and-effect one.

Let's consider the correlation on the example of indicators of innovative activity and innovative potential of an industrial enterprise. Figure 2a shows a positive correlation, where each point is a single dimension. Figure 2b shows a negative correlation. Figure 2c shows values without correlation (Basovsky, 2002).

Figure 2: *a) positive correlation b) negative correlation c) lack of correlation.*



Source: Compiled by the authors.

To characterize the degree of correlation, there is a value describing the correlation process – the correlation coefficient. The correlation coefficient is a measure of the linear relationship between two variables.

If the correlation is linear, the correlation coefficient is 1 or -1. If there is no correlation between the two objects, the correlation coefficient will be 0. The correlation scale is shown in the table (tab. 1).

Table 1: *correlation scale of values.*

Values of the coefficient r	The degree of connection
0,75 - 1	Very high positive
0,50 – 0,74	High positive
0,25 – 0,49	Average positive
0 – 0,24	Weak positive
-0,24 - 0	Weak negative
-0,49 - -0,24	Average negative
-0,74 - -0,50	High negative
-1 - -0,75	Very high negative

Source: Compiled by the authors.

Correlation analysis is suitable for calculating the innovative potential and innovative activity of an industrial enterprise. It is able to identify the relationship, clearly show it in the form of a correlation coefficient. However, it is better to use the regression analysis method in the calculation, since it gives an accurate characteristic and degree of influence. Similarly, correlation analysis shows the relationship of two related events, and regression analysis can describe the relationship of two poorly related events.

In addition to correlation analysis, regression analysis is often used. The methodology for assessing the innovative potential and innovative activity of an enterprise is based on the assessment of indicators of a set of criteria that characterize these concepts. To take into account the degree of influence of each indicator, as well as to filter out indicators that do not affect the number of implemented innovations, you should use mathematical methods to determine the relationship of indicators and the degree of their influence on the main indicator. One of these methods is regression analysis, which results in a coefficient of correlation between the indicator and the number of implemented innovations. The method describes the nature of the relationship between two variables. The goals of regression analysis are:

- Determining the degree of determinism of dependent variable variants by independent variables
- Calculating the value of a dependent variable using independent variables
- Determining the contribution of private independent variables to the variation of the dependent variable

Regression analysis shows the degree of influence of characteristics on the main factor. The method is based on regression equations, mathematical formulas that are applied to variables in order to predict the dependent variable (formula 3,4) (Berezhnaya, Berezhnoy, 2005)

$$E(Y \mid X) = F(X, \beta) \quad (3)$$

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_n x_n + \varepsilon \quad (4)$$

Where,

Y - is a dependent variable that we need to determine the effect on. The variable describes the process that is most important to us. In our case, this is the number of implemented innovations.

β - is the coefficient of influence of variable x on the dependent, main variable Y. the coefficient describes the strength and type of relationship between two variables.

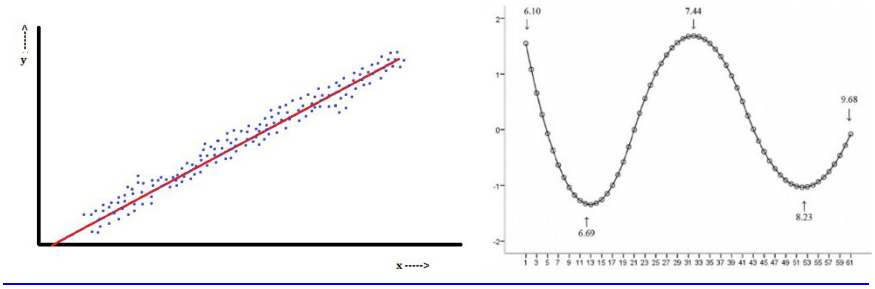
ε - is a random error, it is the set of all random variables that occur and cause the error.

x - is a variable whose degree of influence and relationships on the dependent variable we find by regression method.

Creating a regression model is an iterative process that seeks to find effective variables x that explain variables Y. the Process is repeated many times, adding or removing variables.

Depending on the nature of the process and the relationship, the process can be linear or nonlinear (Fig. 3) (Gladilin, 2006)

Figure 3: *a) linear regression, b) - not linear regression.*



a) b)

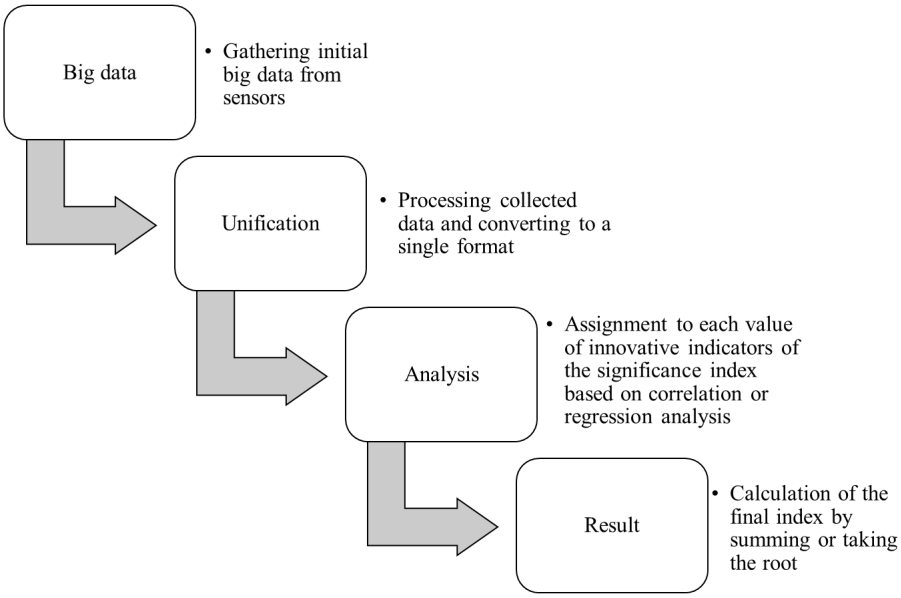
Source: Compiled by the authors.

The advantages of this method are its accuracy, simplicity, and visibility. The method clearly shows the relationship of two variables and the degree of influence of one on the other, which allows you to set the significance coefficients, as well as exclude values that do not affect the main value or those values that have a close relationship with other factors of influence and duplicate them. The method is not complicated and therefore accessible and easy to apply. You can calculate the degree of relationship and influence using the simplest Microsoft Excel program with the Power Query add-in. The method is also visual, since it gives coefficients that explicitly characterize the type of connection.

The method of regression analysis is well applied for evaluating the innovative potential and innovative activity of an industrial enterprise.

Based on these methods, we can make an algorithm for working with data to assess the innovative potential and innovative activity of an industrial enterprise (Fig. 4).

Figure 4: *the sequence of mathematical operations used to evaluate the innovative potential and innovative activity of an enterprise.*



Source: Compiled by the authors.

Conclusion

First, big data is collected from devices and sensors in the enterprise, then it is converted to a common format so that it is easy to read. After that, each value and each group of values is assigned a significance coefficient using the correlation or regression analysis method. Then the values are calculated as the sum or root.

Mathematical methods used for searching and analyzing new information in data science are perfectly applicable for calculating the innovative potential and innovative activity of an industrial enterprise in the digital economy and should be used in industrial enterprises.

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