

Approach to assessing the impact of motivation on employee performance in an inclusive environment

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Abstract

The development of motivational questionnaires for teachers working with inclusive children is a vital instrument for identifying and analyzing their professional needs. Employment in an inclusive setting necessitates that staff members not only possess high qualifications and demonstrate flexibility in pedagogical methods but also exhibit internal readiness, psychological resilience, and a sufficient level of motivation. Surveys facilitate the collection of objective data concerning factors that influence the efficacy of pedagogical activities, enabling the identification of key needs among teachers and the determination of conditions essential for their satisfaction. This, in turn, provides a foundation for the formulation of targeted support measures, the individualization of professional development, and the enhancement of the quality of inclusive education. Moreover, the systematic application of motivational questionnaires contributes to the development of a psychological profile of the staff, thereby assisting management in the effective administration of human resources, making timely administrative decisions, and ensuring optimal conditions for productive work. Consequently, identifying the personalized impact of motivational factors on staff effectiveness working with inclusive children represents a pertinent issue; addressing this will have a direct influence on the quality of the educational process and the socialization of children with special educational needs.

Keywords

assessment, work efficiency, testing, quality, needs analysis, expert system, inclusion, motivational factors, software system

1. Introduction

As of today, inclusive education represents one of the most pivotal areas of development within educational systems, as the number of pupils and students with special educational needs continues to rise steadily each year. According to the State Statistics Service, as of 2020, approximately 163,000 children with disabilities were registered in Ukraine. Of these, only 78,000 children received education, with nearly 37,000 still attending segregated special schools, which are typically situated far from the children's residences. In 2023, the number of children engaged in inclusive education remained approximately at the same level (figure 1). Nevertheless, considering the overall decline in the child population, these figures suggest an increasing prevalence of disability among children [1, 2, 3, 4, 5].

Table 1 illustrates the number of children with disabilities under the age of 18 across various regions.

Based on the presented table, the positive data may be attributed to three regions: Donetsk, Luhansk, and Kherson; however, this perspective is only applicable to those lacking awareness of the current situation in Ukraine. Regrettably, a significant portion of the population has been compelled to evacuate parts of these regions due to military operations and occupation, or, in some cases, has unfortunately

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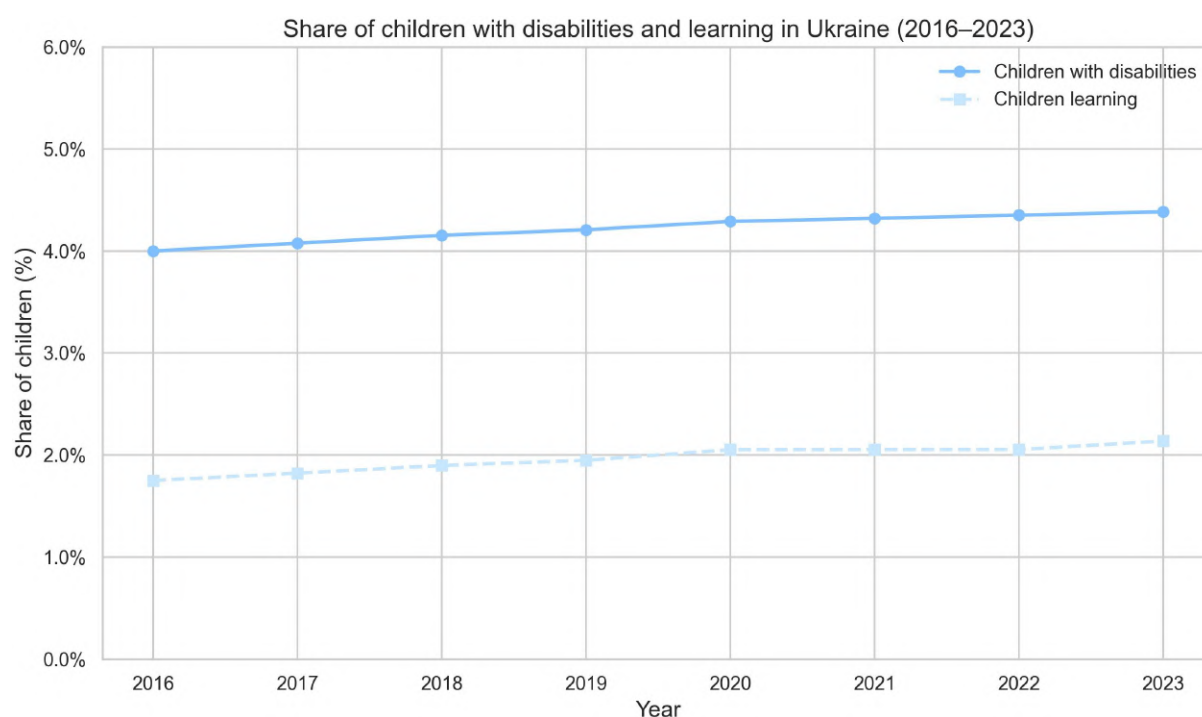


Figure 1: Share of children with disabilities and learning in Ukraine (2016–2023).

lost their lives or remains under the control of occupation authorities. Consequently, the data from these regions is more concerning than reassuring [6, 7].

Figure 2 illustrates the number of children under the age of 18 with disabilities across various disease categories. As observed, the highest proportion of inclusive disabilities is attributed to conditions related to mental disorders, neurosystem diseases, deformities and chromosomal abnormalities, as well as eating disorders and metabolic disturbances.

Regrettably, the proportion of children continues to increase steadily each year. Considering current realities, which exacerbate adverse effects on children's mental health, it is unlikely that this percentage will decrease in the near future; at best, it will stabilize. Consequently, the government and, in particular, the education system face a considerable challenge – to develop effective methods of socializing children within the context of inclusion in everyday life. According to statistical data, as of the beginning of the 2017/18 academic year, over 13,000 students with disabilities were enrolled in higher education institutions in Ukraine. The majority of these students, approximately 9,735 individuals, were pursuing their education at universities, academies, and institutes, whereas only 3,481 students attended colleges, technical schools, and vocational schools. Additionally, survey data collected from guardians and parents concerning general difficulties across various regions – particularly those near frontlines – indicate that one of the most persistent issues remains the accessibility of educational institutions and education in general.

All of the above demonstrates the young people's desire with special needs to obtain quality education, while also highlighting additional barriers to learning, particularly inadequate adaptation of materials, lack of specialized support, and low motivation among educational staff to engage with inclusive children. Consequently, the initial phase of our research will involve examining the motivational factors influencing educational staff, which will facilitate the development of effective strategies for working with inclusive children and enhancing overall efficiency.

Table 1

The count of children under the age of 18 with disabilities across different regions (2020–2022).

Region	2020		2021		2022	
	Total	Newly recognized as children with disabilities	Total	Newly recognized as children with disabilities	Total	Newly recognized as children with disabilities
Ukraine	162923	13149	162214	15311	156010	16115
Autonomous Republic of Crimea	...	...	...	...	...	...
Vinnitsya	6655	482	6348	522	6134	495
Volyn	5410	449	5715	560	5498	512
Dnipropetrovsk	13304	1037	13155	1069	13163	1257
Donetsk	6994	561	6687	575	4674	89
Zhytomyr	5959	431	5973	523	6031	542
Zakarpattia	7084	517	6943	628	7754	1191
Zaporizhzhia	7092	646	7237	718	4126	469
Ivano-Frankivsk	6213	528	6425	722	6944	1023
Kyiv	8514	710	8452	795	8196	859
Kirovohrad	3840	300	3842	391	3885	331
Luhansk	2145	154	2188	217	2092	12
Lviv	11250	893	11185	1096	11494	1400
Mykolaiv	5091	395	4501	354	4618	279
Odesa	8529	719	8496	879	9053	1387
Poltava	5273	433	5345	504	5164	464

2. Problem statement

As discussed in the introductory section, a significant task involves the development of innovative solutions and approaches to facilitate the social integration of children within an inclusive society. This includes the creation of adaptive mini eco-systems designed to ensure that children do not experience feelings of loneliness. However, any educational system or methodology, to some degree, necessitates the child's interaction with an educational professional. The most critical factor in this collaboration, in order to achieve optimal results, is the interest and motivation of the educational professional to allocate more than the usual amount of time to an inclusive child, particularly considering that various forms of inclusion differ from one another.

The motivational process when working with children in an inclusive environment is unique to each professional and does not always lend itself to precise prediction. The same stimuli may influence educators differently: for some, material or moral factors will be paramount, while for others, internal calling and the desire to assist the child will be decisive.

Every professional possesses individual career objectives and values that influence their motivation to achieve results. For some, engaging with inclusive children serves as a source of inspiration and a motivation to attain substantial success, whereas others may view it as a challenge necessitating further internal drive. Consequently, the same motive – such as the desire to observe a child's progress – can impact educators in markedly diverse manners.

Another possible situation arises when two specialists share the common objective of fostering a conducive environment for a child's development. However, for one individual, this motive becomes predominant, prompting a willingness to exert maximum effort and sacrifice personal time. Conversely, the other prefers to attain results through collaboration, task delegation, and mutual support. This divergence results in differing approaches to work organisation and conduct within a professional setting [8, 9].

The needs of the employee can be categorized into three principal groups, subject to conditional

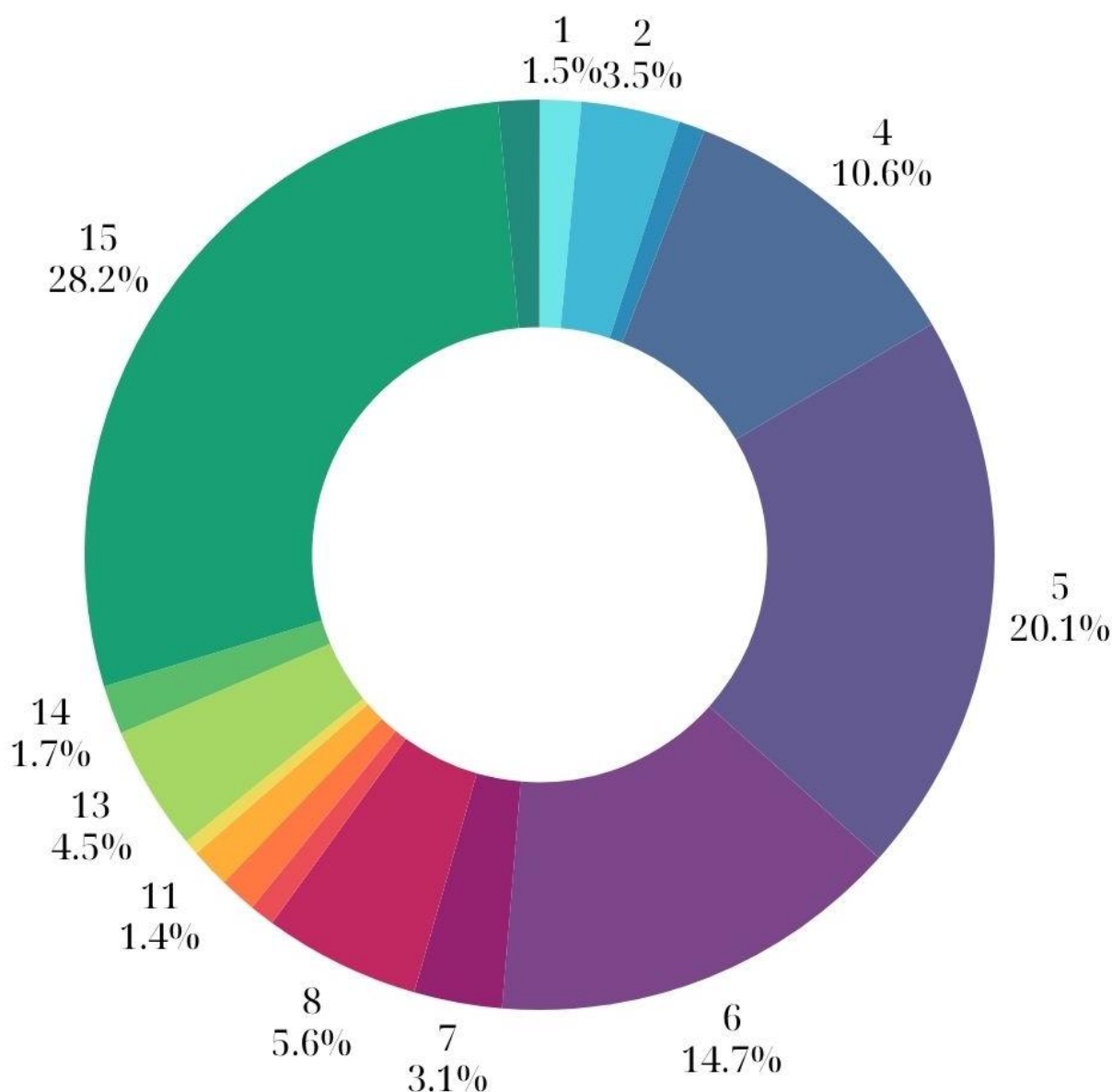


Figure 2: The number of children with disabilities under 18 by disease classes: 1 – Infectious and parasitic diseases; 2 – Neoplasm; 3 – Diseases of the blood and bloodforming organs and certain disorders involving the immune mechanism; 4 – Endocrine system, nutritional and metabolicdisenses; 5 – Psychological and behavioural; 6 – Diseases of the nervous system; 7 – Diseases of the eye and its appendages; 8 – Diseases of the ear and mammary gland; 9 – Diseases of the circulatory systemn; 10 – Respiratory diseases; 11 – Diseases of the digestive system; 12 – Diseases of the skin and subcutaneous tissue; 13 – Diseases of the musculoskeletal system and connective tissue; 14 – Diseases of the genitourinary system; 15 – Congenital anomalies (malformations), deformities and chromosomal abnormalities; 16 – Injury, poisoning and certain other consequences of external causes; 17 – Other causes.

assessment.

1. **Physiological or material needs** refer to the resources necessary for an individual to fulfill their requirements. In the context of a worker's responsibilities involving inclusive children, the following needs can be broadly identified:

- **The basic salary, considering the complexity of the work (M1)**, should reflect the fact that this is a specialized category of pedagogical work, which necessitates high emotional resilience and additional competencies.
- **Provision for employment within an inclusive environment (M2)**, which constitutes an additional remuneration for working with children who have special educational needs.

- **Additional compensation for professional experience in the domain of inclusive education (M3)**, specifically an elevated allowance provided to employees based on their experience in inclusive activities, as such experience is deemed to carry significant value.
 - **Additional payments for individual support and extra workload (M4)** underscore the significance of receiving appropriate compensation for the additional time dedicated to the child and specific discipline in general. This includes activities such as conducting supplementary extracurricular individual lessons, developing tailored curricula, maintaining supporting documentation, among others.
 - **Awards designated for advancements in a child's or group's development (M5)**, which are granted not solely based on 'work results' but specifically in recognition of tangible positive transformations in children's growth – such as successful adaptation, acquisition of new skills, and enhanced socialization levels.
2. **Social needs encompass** the requirements in labor activities, socio-economic endeavors, and spiritual culture; in other words, they pertain to all aspects of social life. Among these, particularly considering the employee's work within an inclusive environment, the following are of fundamental importance:
- **Enhancement of professional competence in the field of inclusive education (S1)** encompasses the opportunity to participate in specialized training sessions and courses in pedagogy, psychology, and adaptation for children with special educational needs.
 - **The capacity to exhibit initiative when engaging with children (S2)**, the liberty to propose new methods, tailored programmes, and innovative strategies for each child's development.
 - **Prospects for professional growth within an inclusive environment (S3)** include the opportunity to develop expertise as an inclusive education specialist, engage in programme management, assume additional responsibilities, and accrue valuable experience.
 - **Recognition and authority within the team and community (S4)** constitute a social status that is established through competence, responsibility, and success in supporting children with special needs.
 - **The high social significance of activity (S5)** pertains to the profound sense that one's work genuinely impacts children's lives, fosters their integration and development, and holds importance for families and the community.
3. **Psychological needs encompass** the desire for effective communication with colleagues at the workplace, participation in cultural events, recognition of individuals as unique among their peers and acquaintances, the enhancement of psychological resilience, and the development of one's inner world. Considering the specific nature of professional work, these fundamental needs can be delineated as follows:
- **Participation in professional and cultural events that emphasize inclusion (R1)** encompasses attendance at seminars, workshops, conferences, and training sessions dedicated to inclusive education, the exchange of experiences, and contemporary methodologies for engaging with children with special educational needs.
 - **Constructive communication and support within the team (R2)** – engaging in regular exchanges of experiences with colleagues, providing psychological support, participating in group case discussions, and consulting with specialists such as psychologists and defectologists. These activities serve to alleviate stress and enhance motivation.
 - **Flexible working hours considering workload (P3)** – the capacity to modify working schedules and study plans to effectively balance educational responsibilities, preparation of tailored programmes, and the recovery of emotional resources.
 - **The opportunity for self-realisation and professional development (R4)** involves the implementation of one's own pedagogical ideas, the application of innovative methods, and participation in projects and research within the field of inclusive education.

- **Comfortable working conditions that support psychological health (P5)** include a safe and cozy learning environment, accessible resources, adapted workplaces, and support for the teacher's psycho-emotional well-being.

3. Assessment of the impact level of motivational factors on the work efficiency of employees with inclusive children

To analyze the impact of motivation levels on the performance of employees with inclusive children, it is essential to identify the specific motivational factor most in demand for each individual employee. Accordingly, enhancing this particular motivational factor is expected to maximize the employee's work efficiency in the future [10, 11, 12, 13, 14, 15, 16].

The algorithm for evaluating the influence of motivational factors on the efficiency of an employee working with inclusive children comprises the following steps.

Step 1. The assessment of the impact level of motivational factors on the work efficiency of employees with inclusive children will be conducted based on the following performance indicators:

- **Qualification (Q)** provides an opportunity for a worker to acquire comprehensive professional knowledge and skills in the domain of inclusive education. It also enables the individual to learn how to effectively adapt lessons to meet each child's needs and to implement contemporary pedagogical methods.
- **Effectiveness (E)** pertains to the employee's capacity to attain a sense of accomplishment in child's development, monitor improvements in learning, socialization, and adaptation.
- **Initiative (I)** represents an employee's opportunity to acquire experience in implementing innovative ideas, methods, and approaches that enhance the learning process and promote the development of children within an inclusive environment.
- **Self-development (SD)** represents an opportunity for employees to engage in continuous enhancement of their competencies, acquire new methodologies, critically analyze their own practices, and cultivate professional skills.
- **Adaptability (A)** refers to a worker's capacity to acquire experience in flexibly addressing the individual needs of children, as well as to modify teaching strategies and behaviors in accordance with their developmental stage, emotional condition, and the unique characteristics of each pupil.

Step 2. Analysis of the impact of motivational factors. At this stage, each employee involved in working with inclusive children must independently evaluate the extent to which the motivational factors from the three groups outlined above influence their effectiveness by completing the corresponding questionnaire. As an illustrative example, we provide questionnaires filled out by four distinct university lecturers (two women and two men, including one with three years of experience working with inclusive children).

For the purpose of facilitating the survey analysis, the results shall be presented in a graphical format as a diagram illustrating employees' motivational factors.

An analysis of the data presented in table 2 and illustrated in figure 3 indicates that social factors constitute the primary motivation for the initial respondent. Specifically, when such an employee receives consistent support in all their endeavors, including ideological assistance and resource allocation, the qualitative aspects of their engagement with inclusive children will progressively enhance.

The overall level of ratings depicted in the figure 4 demonstrates a greater degree of balance than that observed in the preceding example. It is apparent that individuals value consistent motivation across all domains.

Overall, it is apparent that the individual maintains a balanced mood and demonstrates preparedness to work with inclusive children, with their primary resource being internal psychological motivation and the desire to realize their own ideas. It is important to highlight that this result is derived from a respondent who has three years of experience working with inclusive children.

Table 2

Analysis of the influence of motivation factors for respondent 1

Factors	Qualification	Effectiveness	Initiative	Self-development	Adaptability
M1	8	7	4	4	5
M2	6	9	4	4	5
M3	6	8	4	4	5
M4	9	9	6	7	6
M5	9	9	4	7	5
Average	6.6	8.4	4.4	4.6	5.0

Factors	Qualification	Effectiveness	Initiative	Self-development	Adaptability
S1	10	7	9	9	7
S2	8	9	10	5	6
S3	7	6	7	8	9
S4	10	6	10	9	10
S5	6	3	6	9	8
Average	8.0	5.4	8.6	8.0	7.4

Factors	Qualification	Effectiveness	Initiative	Self-development	Adaptability
P1	9	8	8	9	10
P2	5	5	8	6	7
P3	4	8	4	8	9
P4	10	7	8	9	8
P5	6	9	8	4	5
Average	6.8	7.2	6.4	7.4	7.2

Table 3

Analysis of the influence of motivation factors for respondent 2.

Factors	Qualification	Effectiveness	Initiative	Self-development	Adaptability
M1	3	7	6	5	5
M2	7	7	6	7	6
M3	8	6	6	6	5
M4	4	5	4	5	6
M5	5	8	7	8	7
Average	5.4	6.6	5.8	6.2	5.8

Factors	Qualification	Effectiveness	Initiative	Self-development	Adaptability
S1	7	7	6	7	8
S2	7	8	8	6	6
S3	6	7	7	6	7
S4	4	5	4	5	4
S5	5	7	6	6	6
Average	5.8	6.8	6.2	6	6.2

Factors	Qualification	Effectiveness	Initiative	Self-development	Adaptability
P1	4	5	5	5	4
P2	6	8	8	7	6
P3	5	7	8	7	8
P4	7	8	8	9	6
P5	4	8	7	6	4
Average	5.2	7.2	7.2	6.8	5.6

Table 4

Analysis of the influence of motivation factors for respondent 3.

Factors	Qualification	Effectiveness	Initiative	Self-development	Adaptability
M1	8	7	4	4	5
M2	6	9	4	4	5
M3	6	8	4	4	5
M4	4	9	6	4	5
M5	9	9	4	7	5
Average	6.6	8.4	4.4	4.6	5

Factors	Qualification	Effectiveness	Initiative	Self-development	Adaptability
S1	10	7	9	9	7
S2	8	9	10	5	6
S3	6	7	8	9	7
S4	10	4	10	8	9
S5	6	3	6	9	8
Average	8	5.4	8.6	8	7.4

Factors	Qualification	Effectiveness	Initiative	Self-development	Adaptability
P1	9	8	8	9	10
P2	5	5	8	6	7
P3	4	8	4	8	9
P4	10	7	8	9	6
P5	6	8	4	5	4
Average	6.8	7.2	6.4	7.4	7.2

Table 5

Analysis of the influence of motivation factors for respondent 4.

Factors	Qualification	Effectiveness	Initiative	Self-development	Adaptability
M1	6	8	5	6	5
M2	7	9	8	8	6
M3	8	8	7	7	4
M4	3	9	8	8	6
M5	8	9	7	8	6
Average	6.4	8.6	7	7.4	5.4

Factors	Qualification	Effectiveness	Initiative	Self-development	Adaptability
S1	8	8	6	9	9
S2	7	7	8	8	8
S3	7	6	8	9	7
S4	9	7	4	9	5
S5	6	7	6	8	5
Average	7.4	7	6.4	8.6	6.8

Factors	Qualification	Effectiveness	Initiative	Self-development	Adaptability
P1	7	6	8	7	8
P2	4	7	8	7	6
P3	5	9	8	7	7
P4	6	7	8	8	7
P5	7	9	8	9	8
Average	5.8	7.6	8	7.6	7.2

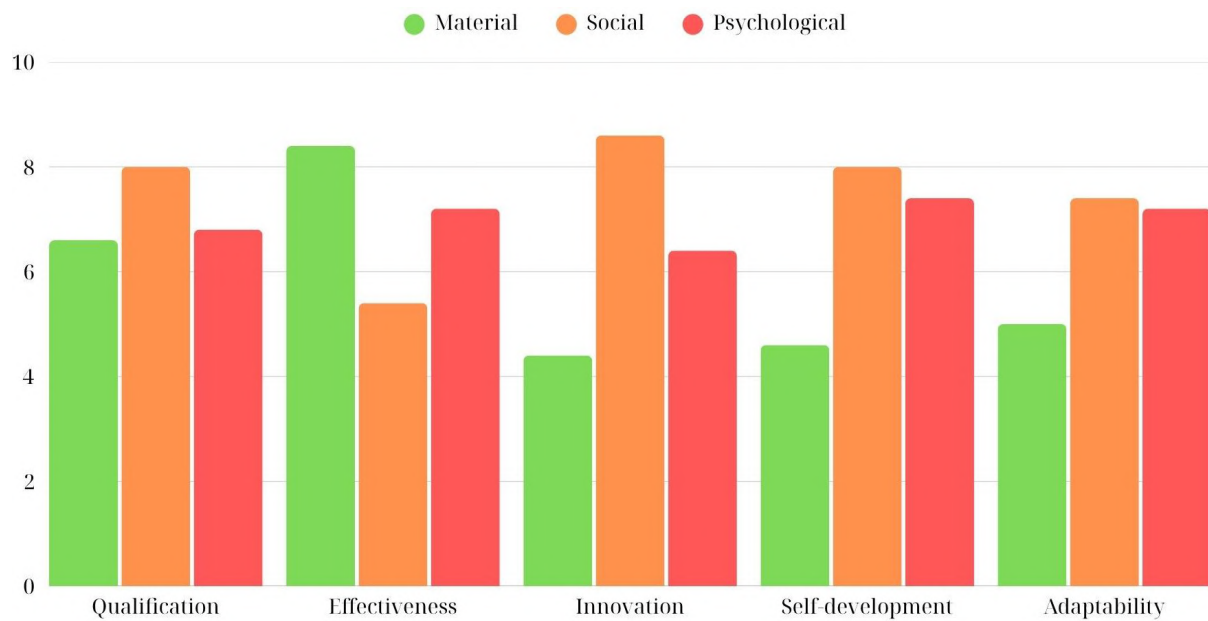


Figure 3: Scale for assessing the level of influence of motivational factors for respondent 1.

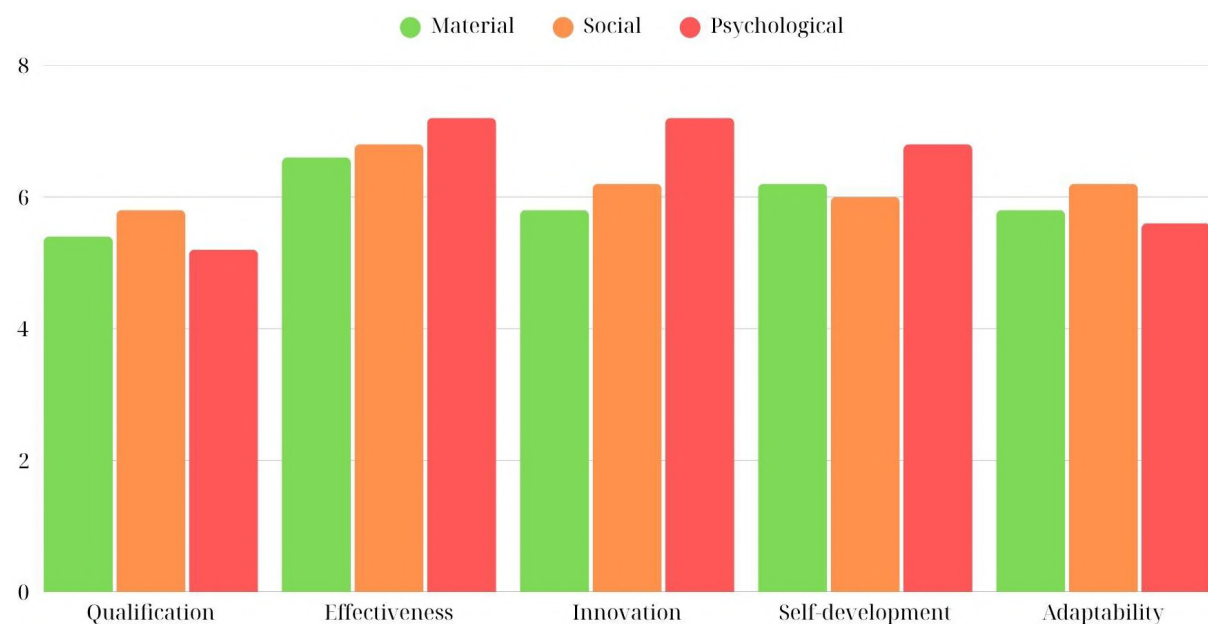


Figure 4: Scale for assessing the level of influence of motivational factors for respondent 2.

The additional motivation for such an employee will be the consistent backing of their innovations, financial expenditures, ideas, etc., to facilitate comprehensive work with children requiring inclusive education.

The psychotype of the third respondent (figure 5) is notably intriguing. The indicators of material motivational factors are prominently high, which aligns with standard expectations for any employee – engaging in work in exchange for reward. Nevertheless, the factors surpassing material motivations are psychological in nature, characterizing the individual as emotional, compassionate, and inclined towards self-reflection. Such traits may not invariably be advantageous when engaging with inclusive children. Consequently, when addressing the motivation of such an employee, it is more advisable to redirect focus towards routine tasks that serve to minimize the psychological component.

In figure 6 and table 5, the results from four respondents are presented concerning how various

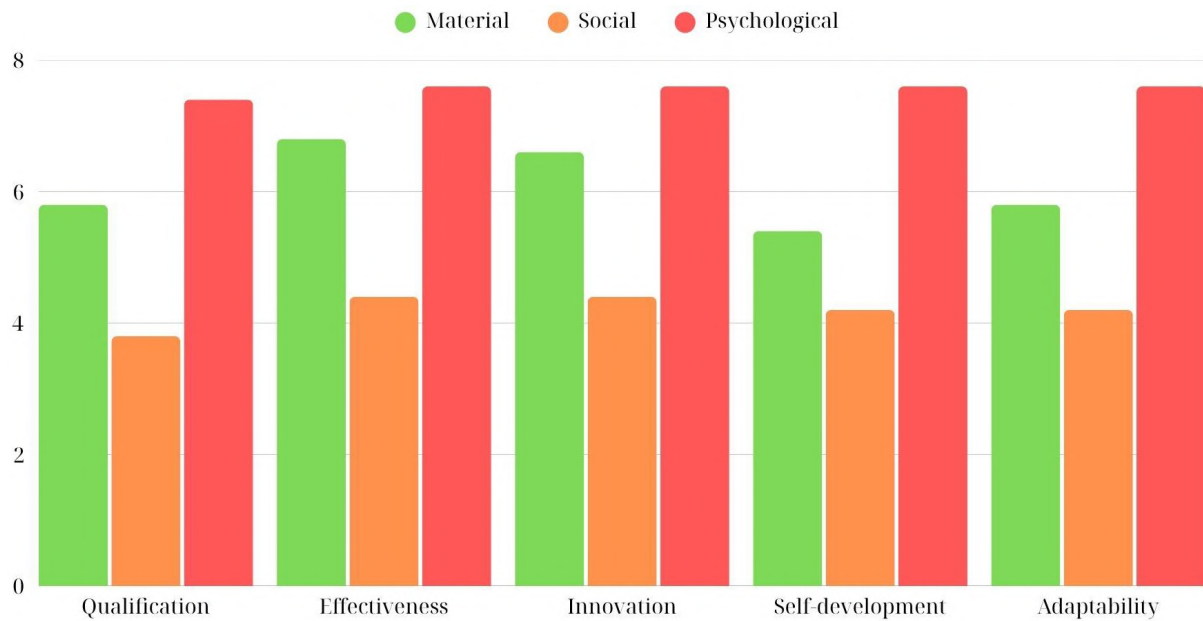


Figure 5: Scale for assessing the level of influence of motivational factors for respondent 3.

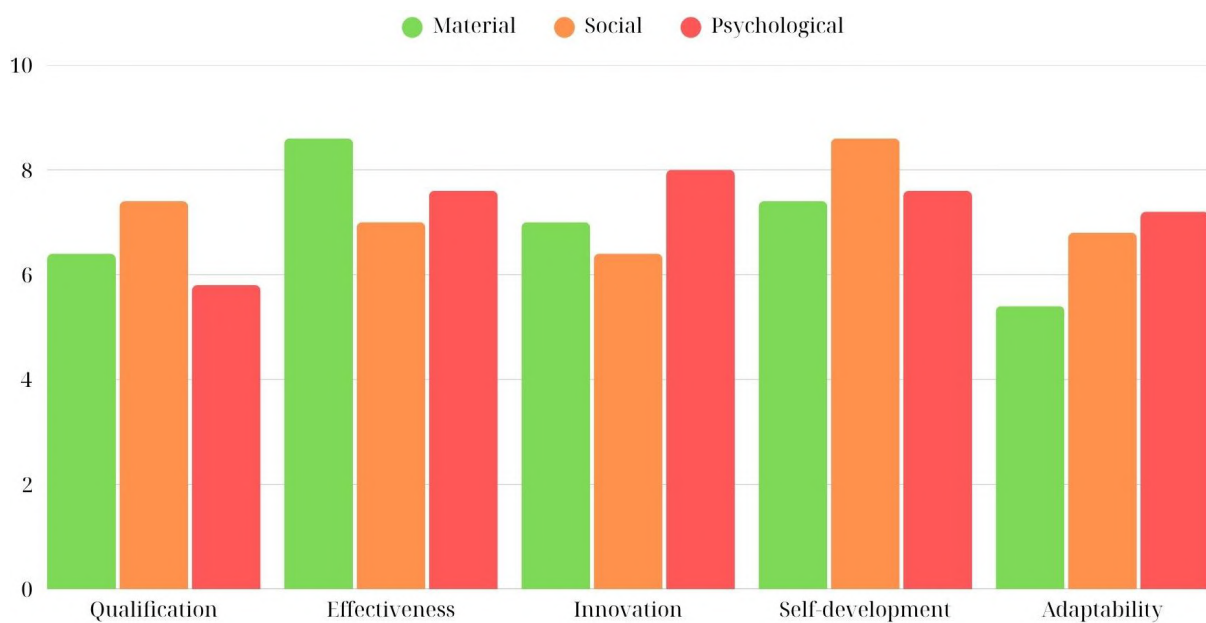


Figure 6: Scale for assessing the level of influence of motivational factors for respondent 4.

motivational factors influence their potential engagement with inclusive children. Due to their youth, openness to novel experiences, and ambition, their motivational factors are distributed quite evenly. The worker exhibits readiness for new challenges; therefore, maintaining a balance among their aspirations for self-development, initiative, and the exploration of new ideas and methods is essential. Additionally, it is of utmost importance to support their initial efforts in establishing themselves both morally and financially.

Step 3. Formal delineation of the relationship between performance indicators and inclusive children, based on an assessment of the influence level of motivational factors.

To assess the influence weight of each motivational component on a particular performance indicator, numerous factors should be considered, including the type of educational institution, the nature of educational programmes, the type of training, among others. However, considering that the primary and

overarching objective remains to facilitate socialization and learning for inclusive children, the social motivation component should be regarded as the most significant. Therefore, the impact coefficients of the motivational components are as follows:

$k_s = 0.5$ – weighting coefficient of social factors;

$k_m = 0.3$ – the weight coefficient of the influence of material factors, since the material factor will always be a top priority for the employee compared to other key factors;

$k_p = 0.2$ – the weight coefficient of the influence of psychological factors, which accounts for both comfortable working conditions on the one hand, and the moral readiness of the employee to work with inclusive children.

Based on the above, we will determine the performance indicators of an employee working with inclusive children, depending on the influence level of motivational factors.

$$\begin{aligned}
E_{Q_i} &= \frac{\sum_{m_i}^m Q_{m_i}}{m} \cdot k_m + \frac{\sum_{s_i}^s Q_{s_i}}{s} \cdot k_s + \frac{\sum_{p_i}^p Q_{p_i}}{p} \cdot k_p \\
E_{R_i} &= \frac{\sum_{m_i}^m R_{m_i}}{m} \cdot k_m + \frac{\sum_{s_i}^s R_{s_i}}{s} \cdot k_s + \frac{\sum_{p_i}^p R_{p_i}}{p} \cdot k_p \\
E_{I_i} &= \frac{\sum_{m_i}^m I_{m_i}}{m} \cdot k_m + \frac{\sum_{s_i}^s I_{s_i}}{s} \cdot k_s + \frac{\sum_{p_i}^p I_{p_i}}{p} \cdot k_p \\
E_{SD_i} &= \frac{\sum_{m_i}^m SD_{m_i}}{m} \cdot k_m + \frac{\sum_{s_i}^s SD_{s_i}}{s} \cdot k_s + \frac{\sum_{p_i}^p SD_{p_i}}{p} \cdot k_p \\
E_{A_i} &= \frac{\sum_{m_i}^m A_{m_i}}{m} \cdot k_m + \frac{\sum_{s_i}^s A_{s_i}}{s} \cdot k_s + \frac{\sum_{p_i}^p A_{p_i}}{p} \cdot k_p
\end{aligned}$$

After performing the calculations, each employee is assigned a set ordered in descending order:

$$M_i = \text{SORT}(E_{Q_i}, E_{R_i}, E_{I_i}, E_{SD_i}, E_{A_i})$$

of the operator $\text{SORT}(\cdot)$ arranges the elements of the set in descending order.

Focusing on a set of possible performance indicators for a worker with inclusive children, the manager can choose the first elements, that is, to identify in this way those motivational factors that he can improve (stimulate or provide) for the employee, to further motivate him to increase progress in working with inclusive children.

Step 4. Conclusion of the algorithm. Saving the current results to facilitate review and analysis of the variations in the effectiveness of working with inclusive children. Returning to step 1 after a specified period of time.

4. Software implementation of the method for assessing the impact of motivational factors on the performance of employees working with inclusive children

Based on the aforementioned methodology, the SPARK – Survey Platform for Assessing Responsive Knowledge software system was developed.

Figure 7 depicts the procedure for conducting an automated survey of each employee concerning their motivational perception of their work with inclusive children, in relation to designated work performance indicators.

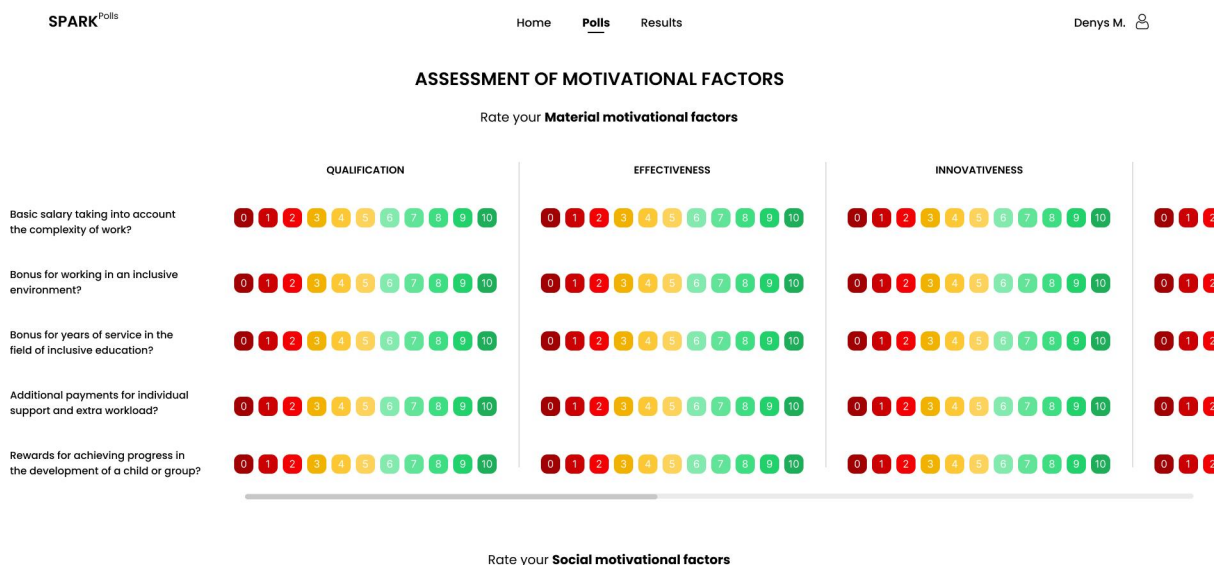


Figure 7: Employees' assessment of their own satisfaction with working conditions with inclusive children.

In figure 8, the graph of each employee's motivation curves is illustrated, constructed based on the calculated set. By clicking on the «More details'» option, the manager can review a set of performance indicators for the employee working with inclusive children for further analysis of their work and to encourage their activity.

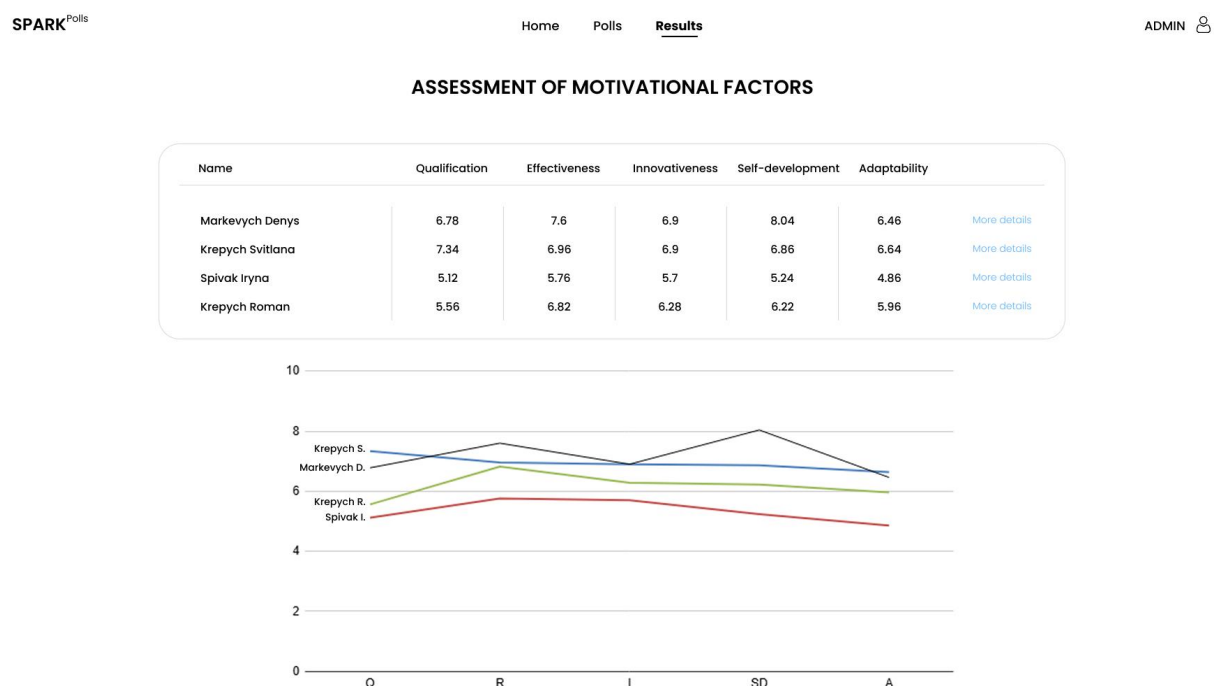


Figure 8: The representational form of the motivational sets of employees.

5. Conclusion

The approach to evaluating the influence of motivation on teachers' performance within an inclusive environment, as discussed in this article, permits us to draw the following conclusions.

1. It is advisable to conduct regular surveys to assess the importance of the needs of each teacher involved in working with children with special educational needs.
2. Based on the collected information, it is essential to develop strategies to address these needs, thereby enhancing the efficacy of pedagogical activities.

For the management of educational institutions, this methodology may also be employed to develop a psychological profile of the educator. Such profiling will facilitate a more comprehensive understanding of their professional and personal objectives, enable an appropriate assessment of their preparedness to work with inclusive children, and support the timely implementation of managerial decisions.

Declaration on Generative AI

The authors have not employed any Generative AI tools.

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