**МЕНЕДЖМЕНТ/ MANAGEMENT**

# Selected aspects of the correlation between indicators used in public administration in the field of human capital formation

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**Abstract.** The role of human capital in the global economy is increasing. The education system makes an important contribution to the formation of human capital. One aspect of the education system that is gaining prominence is additional education for children. This is becoming an increasingly important factor in fostering harmonious human development and the full realization of human potential. In the sphere of state and local administration in the field of education, such indicative indicators as the enrollment of children in additional education and the average score on the Unified National Test are used. We believe that there is a certain correlation between these indicators. The purpose of our study is to test this hypothesis and find out whether there is a correlation between these indicators. If such an influence is discovered, this will make it possible to adjust educational policy in the field of additional education for children, which, in turn, will help to increase the average score on the unified national testing.

The results of the study allow us to conclude that in some regions of Kazakhstan there is a direct, strong correlation between indicators of the level of enrollment of children in additional education and indicators of the average score on the unified national testing. These data update further in-depth study of certain aspects of additional education for children.

**Keywords:** human capital, education, public administration, enrollment of children in additional education, average score of the unified national test, correlation, human potential.

**Introduction**

In the modern world, the importance of education in the formation of human capital is increasingly recognized [1]. There is competition for talent; it is no coincidence that such a formulation as "talent management" appeared [2]. The quality of human capital largely depends on investments in education, where the most important entity is the state, which plays the role of a mechanism for meeting social needs, and, at the same time, public administration involves the optimal use of available resources [3].

The formation of human capital begins in childhood, while the Heckman curve [4] shows that investments from early childhood are much more effective than all subsequent programs at a later time [5].

The relevance of problems related to education can be judged by the actions that are being taken in the international arena to improve the level of education in the world. Thus, at the World Education Forum under the auspices of UNESCO, the Education 2030 agenda, the Incheon Declaration and Framework for Action to implement Sustainable Development Goal 4 - ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for everyone. UNESCO and its partners have been tasked with guiding and coordinating the implementation of the Education 2030 Agenda to ensure inclusive, equitable, quality education around the world.

In the analysis of the current situation, according to the Concept of Kazakhstan entering the 30 most developed states of the world, key trends, tendencies and challenges have been identified. And on their basis, a vision of Kazakhstan by 2050 was formed. According to this Concept, when determining the strategic directions for the long-term development of Kazakhstan, one should form one's own individual model of success. And the first among the strategic directions is the development of human potential, which involves meeting the basic needs of a person in high-quality and accessible education, organizing opportunities for his creative self-realization, etc. This Concept for the development of education assumes the following measures:

– a modern and effective mechanism for the development of children from an early age will be formed;

– educational policy and school education will be modernized;

– the mechanism for managing education will be improved, as well as its financial support.

The development of the education system in Kazakhstan has developed in such a way that it is based on compulsory secondary education, but along with compulsory secondary education in the education system, there is such a subsystem as additional education for children. Additional education of children (hereinafter referred to as "AEC") acts as a process of education and training carried out for the purposes of moral, intellectual, cultural, and physical development, designed to satisfy diverse needs and create conditions for the development of the individual, his self-determination and creativity, the disclosure of abilities, social adaptation, the formation of civic consciousness, general culture, a healthy lifestyle, and the organization of meaningful leisure. Providing additional education in different countries is organized differently; for example, in Kazakhstan, providing additional education and approving the state educational order for additional education fall within the competence of local executive bodies (akimats).

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In the analysis of the current situation, considered in the State Program for the Development of Education and Science of the Republic of Kazakhstan for 2020 - 2025, inequality in access to education was noted, which is enhanced by unequal access to additional education. It is noted that the role of additional education in the modern world is increasing, and about 70% of learning in the lives of young people is carried out through non-formal education. In most OECD countries and 14 OECD partner countries, students who participate in more extracurricular science activities have better PISA scores than students who participate in fewer science activities. One of the factors influencing the availability of additional education is that additional education for schoolchildren is mainly provided on a paid basis. Only 22.5% of children attend out-of-school additional education institutions without paying. Therefore, it is advisable to develop per capita financial support for additional education. Overall, comprehensive measures should be taken to reduce disparities in the quality of and access to education at all levels.

Education in the AEC system is more varied than the lesson system at school, and this provides AEC education with more opportunities to implement an individually differentiated approach for each child [6]. Classes in the AEC system are not compulsory, but at the child's choice, the child has the right to choose what to do, in contrast to the compulsory school curriculum, and this, among other things, reveals the individualization of AEC. Such individualization allows the child to find exactly the type of activity for which he has the ability and where he is able to achieve more successful results. This further helps the child with career guidance and their choice of specialization.

The study of the problems of AEC occupies a very modest position against the background of how much attention is paid to issues of general education. Nevertheless, reports from international organizations and think tanks highlight the potential of AEC [7, 8]. It should be noted that the important role of AEC is also evidenced by the fact that in many countries, government authorities are pursuing policies to expand the coverage of AEC [9].

Scientific articles in recent years regarding AEC note the following:

– AEC supports children's positive social and behavioral trajectories [10];

– AEC promotes children's social-emotional development, self-identity, positive attitudes, and trust. [11];

– some AEC activities have a positive impact on academic performance [12];

– society and the state are interested in the possibilities of AEC since it can significantly complement, expand, and improve what happens at school, promote vocational guidance, pre-vocational training, talent identification, etc. [13, 14].

In modern conditions of global competition, it is extremely important for the domestic economy to determine the capabilities of children in order to promptly assist them in specialization based on their abilities. Currently, in educational programs, starting from the middle grades of school, there is a launch of the process of specialization, so, already from grades 7-8, specialized classes and schools of physics and mathematics, chemical and biological directions, physical education and sports directions, etc. are functioning. Specialization is intensifying in higher educational institutions, where there are already specialized universities, faculties, and individual specialties.

It is understood that when choosing a specialty, in addition to other factors, the child at least takes into account what he is good at and what he is passionate about, that is, the type of activity

for which he has certain abilities. Due to the fact that in each specific type of activity, the results of different people's activities can vary significantly, when choosing a specialization, it is worth considering whether a person has the ability for this or that type of activity or not. And one of the indicators that a child has abilities can be the child's successful results at various events, competitions, contests, shows, etc. In this sense, the results of a unified national test can serve as one of the ways to evaluate and select children. Unified National Testing (hereinafter referred to as "UNT") is one of the forms of qualifying exams for admission to a higher education institution in Kazakhstan. The higher an applicant's UNT score, the better his results and the higher his chances of entering a higher education institution. Upon admission to a higher educational institution, children take the UNT in accordance with their chosen specialty.

It should be noted that for children, the AEC system plays a very important role in the sense that, in practice, it allows children to better understand themselves, their strengths and weaknesses, test themselves, their capabilities and abilities, and, moreover, contributes to their most optimal development. All this helps children make an informed choice of specialty, which path to follow, which field to connect their lives with, and which trajectory to start their professional activities. We believe that the more children involved in the AEC system, the better they will be able to understand themselves and their abilities.

In government policy, various indicators are used to more effectively manage the development of the education system. These include, for example, indicators of AEC coverage, the average UNT score, etc.

Indicators of AEC coverage in different regions of Kazakhstan vary significantly, and since AEC acts as a system that allows a child to develop abilities, taking into account that by the time children enter a university, they already have a rough idea of what abilities they have, we assumed and put forward the hypothesis that in Kazakhstan there is a certain correlation between indicators of the level of coverage of AEC and indicators of the average UNT score. We believe this is due to the fact that AEC, unlike compulsory school education, is characterized by the fact that the child has the right to choose the type of activity, and children tend to choose those types of activities for which they have the ability and in which, accordingly, they achieve successful results. At the same time, the more children are involved in the AEC system, the more children have a chance to identify the types of activities to which they are more inclined, capable, and in which they achieve successful results. And, accordingly, if children choose those types of activities for which they are more capable and in which they are successful, they will show better results at the UNT.

Based on the above, we formulated the following research task: to find out whether there is a correlation between the indicators of the level of AEC coverage and the average score at the UNT, and if such a relationship exists, what are its characteristics.

**Methodology**

During the research process, we searched and collected data on indicators of the level of AEC coverage and the average UNT score in the Republic of Kazakhstan. As a result of the work, a database was formed that included statistical data on AEC [15] and UNT based on national

reports on the state and development of the education system in Kazakhstan, prepared by the Information and Analytical Center of the Ministry of Education and Science of the Republic of Kazakhstan [16], data from the Republican Educational Institution, a methodological center for additional education of the Ministry of Education of the Republic of Kazakhstan [17], and the National Testing Center of the Ministry of Science and Higher Education of the Republic of Kazakhstan [18]. Next, these data were systematized, and current state and local policies in this area were analyzed.

Data on the level of AEC coverage and the average score at the UNT were taken for the period from 2004 to 2018. The beginning and end years of the period were due to the fact that data on the average score at the UNT with a regional breakdown were provided only until 2018; for a later period, only nationwide data were provided without a regional breakdown, and for a more complete test of the hypothesis, it is advisable to check the data specifically in the regional section, including. And based on this, the period from 2004 to 2018 was taken.

After the data was collected, compiled, and systematized, work was carried out to check whether there was a correlation between the indicators of the level of AEC coverage and the indicators of the average UNT score. The essence of the work being carried out was to find out when the value of the variable changes—the level of coverage of AEC—whether there is a natural change (decrease or increase) in such a variable as the average UNT score. The correlation analysis made it possible to derive the correlation coefficient and determine whether there is a relationship between the two above variables and, if so, whether it is a direct or inverse relationship, as well as how strong it is.

**Results and discussions**

During the study, the following results were obtained: according to nationwide data, it turned out that there is a correlation between such indicators as the level of AEC coverage and the average UNT score. The direction of the correlation is positive ("direct"); that is, with an increase in the level of coverage of AEC, the average UNT score also increases. The value of the correlation coefficient (strength) was +0.71, which indicates that this degree of correlation is strong (large), since the value of the correlation coefficient is over 0.7.

So, as a result, we found that in the Republic of Kazakhstan for the period from 2004 to 2018, there is a strong positive correlation between the indicators of the level of AEC coverage and the average UNT score equal to the value of the correlation coefficient of +0.71.

For the purposes of more optimal public administration and social development, these data allow us to put forward the following assumption: increasing the level of coverage of AEC will increase the average UNT score. This will indirectly indicate that more children will be able to find those types of activities for which they are more capable, and thus the AEC system will contribute to a more complete development of human potential.

Next, we delved deeper into the research question, drawing attention to some points in the correlation between these same indicators, but not on a national scale, but on a regional scale. The regions where the highest correlation coefficients were observed were selected. For greater clarity, we have combined these regions into one table so that indicators of the level of

AEC coverage and indicators of the average UNT score, as well as indicators of the correlation coefficient, are visible (Table 1).

Table 1. Indicators of AEC coverage, average UNT score and correlation coefficient [15-18].

| Region | Coverage AEC, % | Average UNT score | Correlation coefficient |
|---|---|---|---|
| Akmola region | 31.7 | 79.0 | 0.76 |
| Aktobe region | 47.4 | 85.6 | 0.87 |
| Pavlodar region | 63.5 | 91.0 | 0.74 |
| West-Kazakhstan region | 63.9 | 81.9 | 0.88 |
| The Republic of Kazakhstan | 31.2 | 83.1 | 0.71 |

Note: data on the coverage of AEC and the average score on the UNT are given for 2018, and the correlation coefficient was calculated for the period from 2004 to 2018. Compiled by the author based on data [15-18].

As a result of the analysis of the correlation between the level of AEC coverage and the average UNT score in those regions where the strongest correlation is observed, it turned out that in those regions where the AEC coverage rate is consistently high, the average UNT score is also consistently high, and, conversely, in those regions where the rates of AEC coverage are consistently low, the average UNT score is also consistently low.

Thus, taking into account the high indicators of the correlation coefficient between the level of AEC coverage and the average UNT score both in the region where they are consistently low and, in the region, where they are consistently high, these data give grounds to assert that in certain regions of Kazakhstan, the level of AEC coverage influences the UNT average score.

At the same time, attention should be paid to the fact that such a strong positive correlation between the level of AEC coverage and the level of the average UNT score with a correlation coefficient equal to +0.71 to +0.87 allows us to characterize it as determinative. That is, it can be argued that the level of AEC coverage, with a certain degree of probability, has a significant impact on the level of the average UNT score.

So, we can state that a certain pattern can be traced, but it is not possible to explicitly indicate the dependence function; therefore, by and large, this issue requires even deeper and more thorough research.

At the same time, it should be noted that in some regions of the Republic of Kazakhstan, such as the Atyrau and Turkestan regions, the correlation coefficient is low, although statistically significant, and, for example, in the city of Almaty, the correlation coefficient is statistically insignificant, i.e., there is no correlation at all. There could be many different factors that explain and influence this. We are aware that the average UNT score can be influenced by many other things in addition to indicators of the coverage of AEC. However, this does not detract from the results of the study, which, from our point of view, actualizes further study of the problems associated with the most optimal organization of AEC.

**Conclusion**

Based on the results obtained, we came to the following theoretical conclusions: our hypothesis that there is a certain correlation between the indicators of the level of AEC coverage and the indicators of the average UNT score and that the level of AEC coverage in some regions of Kazakhstan affects the indicators of the average UNT score was confirmed. Taking into account the results of our research, it can be noted that in some regions of Kazakhstan the following pattern can be seen: in those regions where the rates of AEC coverage are high, there are higher average UNT scores, and, conversely, in those regions where the rates of AEC coverage are low, there are indicators that the average UNT score is also lower. It is important to note that this pattern is observed both in regions with high rates of AEC coverage as well as in regions with average and low rates of AEC coverage. That is, there is every reason to assume that, in the event of further successful development of the EDI system and an increase in the coverage of EDI, this will certainly have an impact on improving the average UNT score.

Speaking about managerial consequences, we believe that the most favorable conditions should be created for children in terms of accessibility to AEC, so that every child has the opportunity to take part in AEC clubs and sections. And here, from our point of view, it is necessary that basic AEC clubs and sections be within walking distance, and based on this, it is advisable to create an extensive network of AEC activities based on the school network.

**Author contributions to this article:**

**Abdullakhanov Arman Kazhimuratovich –** data collection and analysis, correlation analysis, interpretation of results and writing the text.
**Sansyzbaeva Galiya Nurymovna** – literature search, checking calculations and results, critical revision of the content of the article text, design and approval of the final version.

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**Отдельные аспекты корреляционной связи между показателями, используемыми в государственном управлении в области формирования человеческого капитала**

**Аннотация.** В мировой экономике растет роль человеческого капитала. Важный вклад в формирование качественного человеческого капитала вносит система образования. Все более важную роль в деле гармоничного развития человека и более полного раскрытия человеческого потенциала в системе образования начинает выполнять такой ее элемент как дополнительное образование детей. В сфере государственного и местного управления в области образования

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используются такие индикативные показатели как охвата детей дополнительным образованием и средний балл на едином национальном тестировании. Мы полагаем, что между такими индикативными показателями, как уровень охвата детей дополнительным образованием и средний балл на едином национальном тестировании существует определенная корреляционная связь. Цель нашего исследования проверить данную гипотезу и выяснить существует ли корреляционная связь между данными показателями. В случае, если такое влияние будет обнаружено, то это позволит на государственном уровне скорректировать образовательную политику в области дополнительного образования детей, что в свою очередь поспособствует улучшению показателей среднего балла на на едином национальном тестировании.

Результаты проведенного исследования позволяют сделать вывод, что в некоторых регионах Казахстана наблюдается прямая сильная корреляционная связь между показателями уровня охвата детей дополнительным образованием и показателями среднего балла на едином национальном тестировании. Данные выводы актуализируют дальнейшие более глубокое изучение отдельных аспектов дополнительного образования детей.

**Ключевые слова:** человеческий капитал, образование, государственное управление, охват детей дополнительным образованием, средний балл единого национального теста, корреляция, человеческий потенциал.

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### Адами капиталды қалыптастыру саласында мемлекеттік басқаруда қолданылатын көрсеткіштер арасындағы корреляцияның таңдамалы аспектілері

**Аңдатпа.** Әлемдік экономикада адами капиталдың рөлі артып келеді. Білім беру жүйесі жоғары сапалы адами капиталды қалыптастыруға маңызды үлес қосуда. Білім беру жүйесінде адамның үйлесімді дамуында және адам әлеуетін толыққанды дамытуда балаларға қосымша білім беру сияқты элемент барған сайын маңызды рөл атқара бастады. Білім беру саласындағы мемлекеттік және жергілікті өзін-өзі басқару саласында балалардың қосымша білім берумен қамтылуы және ұлттық бірыңғай тестілеудегі орташа балл сияқты индикативтік көрсеткіштер қолданылады. Балаларды қосымша біліммен қамту деңгейі мен ұлттық бірыңғай тестілеудегі орташа балл сияқты индикативті көрсеткіштер арасында белгілі бір байланыс бар деп есептейміз. Біздің зерттеуіміздің мақсаты – бұл гипотезаны тексеру және осы көрсеткіштер арасында корреляция бар-жоғын анықтау. Егер мұндай әсер анықталса, бұл мемлекеттік деңгейде балаларға қосымша білім беру саласындағы білім беру саясатын түзетуге мүмкіндік береді, бұл өз кезегінде ұлттық бірыңғай тестілеудегі орташа баллды арттыруға ықпал етеді.

Зерттеу нәтижелері Қазақстанның кейбір өңірлерінде балалардың қосымша біліммен қамтылу деңгейінің көрсеткіштері мен ұлттық бірыңғай тестілеудегі орташа балл көрсеткіштері арасында тікелей күшті корреляция бар деген қорытынды жасауға мүмкіндік береді. Бұл тұжырымдар балаларға қосымша білім берудің жекелеген аспектілерін одан әрі тереңдетіп зерттеуді жаңартады.

**Түйін сөздер:** адами капитал, білім беру, мемлекеттік басқару, балаларды қосымша біліммен қамту, ұлттық бірыңғай тестілеудің орташа балы, корреляция, адами әлеует.

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